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OIL WORLD
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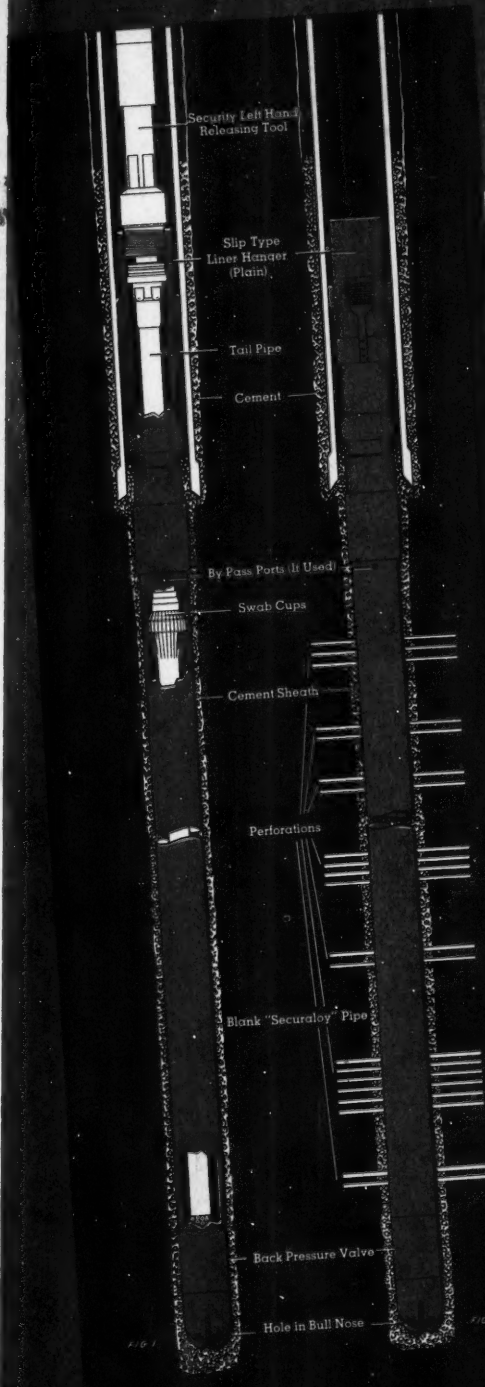
INCREASED DEVELOPMENT EFFICIENCIES

OIL "STRINGERS" ARE DEVELOPED MORE EFFICIENTLY THIS NEW WAY!



In some wells, production is obtained from numerous oil "stringers" separated by gas or water sands—making economical oil production a difficult problem.

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OIL WORLD
and Petroleum Industry

THE AUTHORITY ON THE CALIFORNIA OIL INDUSTRY

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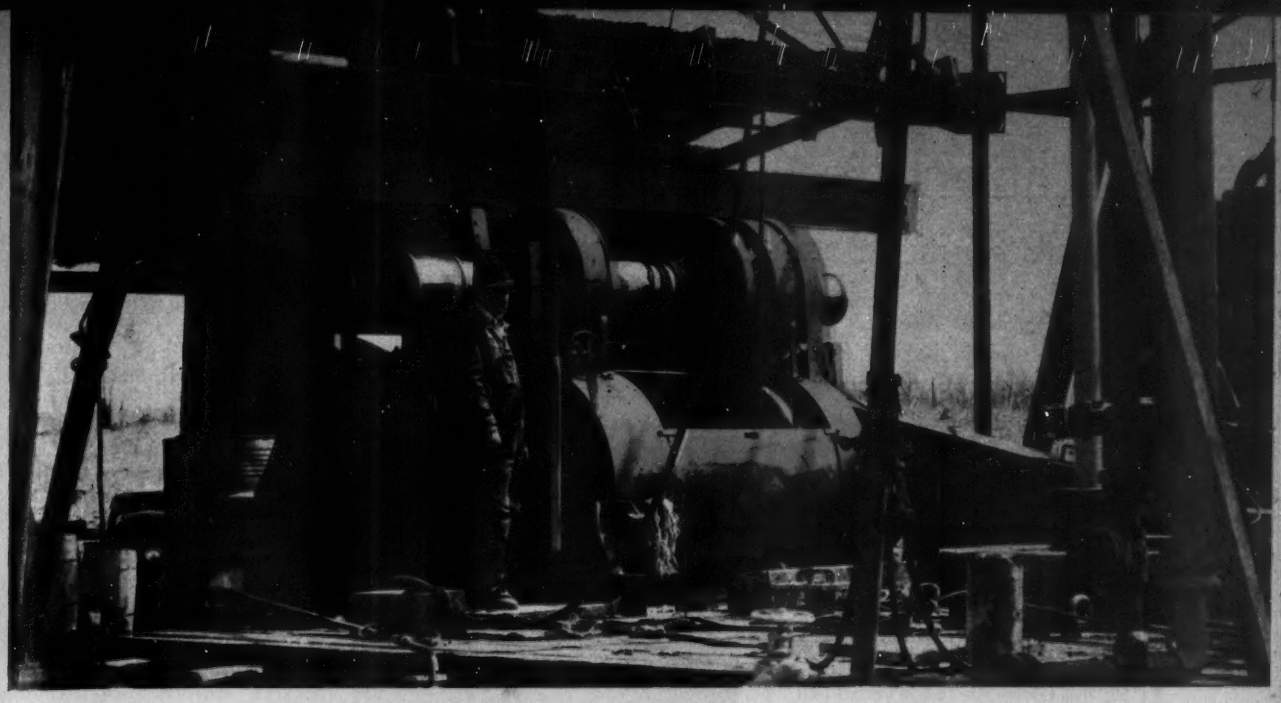

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Additions to California Oil Reserves

in 1938 Paced Consumption[1]

by
Harold W. Hoots[2]
Los Angeles, California

ABSTRACT

Developments in California, including new discoveries and extensions of existing fields, added 253 million barrels of oil to the state's reserve, an amount which is slightly greater than consumption for this year. The success of exploration during the last three years has vastly improved over that for the preceding four years but only to the extent of discovering new oil at a rate comparable to the yearly demand.

GENERAL SUMMARY

Developments in California during 1938 added an estimated 253 million barrels to the state's known oil reserve, an amount which exceeds by 33 million barrels the year's demand for California crude. The net quantity of estimated reserves, is, therefore, slightly higher than a year ago. Discovery of five new fields and new producing zones in four fields discovered in former years contributed an estimated 143 million barrels, while development of earlier discoveries, principally those of 1936 and 1937, accounted for the remaining 110 million barrels.

Harold W. Hoots

Present Reserve Supply and Discovery Rate.—Known oil reserves in California at the close of 1938 are estimated at 3,147 million barrels (Fig. 1). This quantity, although materially less than the 3,869 million barrels estimated for 1928, is 87 million barrels greater than the estimate for 1936.

Known reserves declined from 1928 to 1936 principally because exploration during the intervening 7 years was discouraged by the excessive flush production of Kettleman Hills, Elwood, and Santa Fe Springs and, later, by more general adverse economic conditions. The return of more favorable conditions generally and within the industry, together with a realization that additional known reserves were needed, led to an increase in exploration and the distinct improvement in the discovery rate apparent for the last three years.

The present improved rate of discovery, although keeping pace with consumption, is not satisfactorily replenishing our decreased known reserve supply. Further improvement is desirable. The rate of discovery, however, appears to be directly related to the quantity of exploratory geology and drilling (Fig 8, page 13), and any increase in these activities, or continuation of their present rates, is now discouraged by the present excessive capacity to produce known reserves.

Effect of Excessive Production on the Discovery Rate.—An excessive capacity to produce, or the actual production of excessive quantities of oil, does not necessarily result from the discovery of new fields but rather from the rapid drilling of too many wells in these new fields and the failure to adequately curtail their production. Production in excess of consumption naturally results in an excessive above-ground supply which threatens the price structure and creates general instability. Normal and neces-

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2 Chief Geologist, Richfield Oil Corporation, Los Angeles, California.

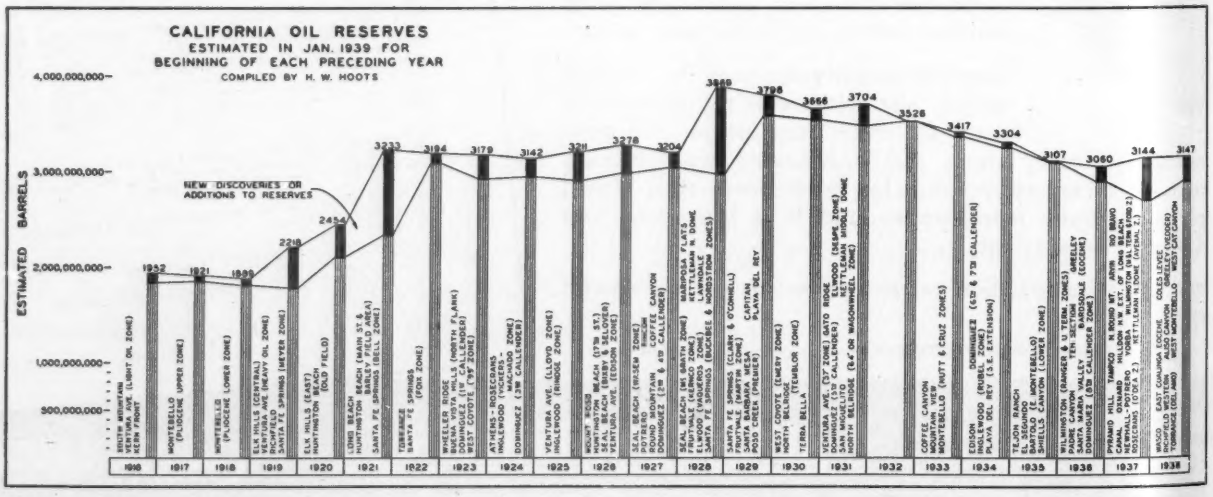

Fig. 1

California oil reserves estimated for beginning of each year. Entire column indicates total estimated reserves. Upper part of columns prior to 1935 indicates present estimate of discoveries; upper part beginning with 1935 indicates new reserves added by reason of new discoveries and extensions of previously discovered fields.

sary exploration for, and discovery of, additional reserves is discouraged. The common result is a progression of declining supply, threatened shortage, good prices, and renewed exploration followed by another period of excessive production.

Decrease of the production rate in conformity with the need for additional oil and with modern principles of maximum economic recovery is important from every viewpoint, particularly in times of ample supply. The present program of voluntary curtailment in California deserves more success. Progress has been made but complete and lasting success in bridling the enlarged capacity of the state to produce depends on the cooperation of every producer in following rules designed to be equally fair to all. The resulting stabilized conditions will insure maximum protection for our reserve supply of oil and will permit exploration for needed additional reserves to proceed with greater efficiency.

There are at present two distinct problems in California which should not be confused. One, the capacity to over-produce, requires that existing wells be equitably curtailed and that the rapidity of drilling additional wells in proved fields be reduced in conformity with the need for additional oil. The other, the increasing demand for oil and the relatively low position of our total known oil reserves, requires that every effort be expended to improve on the moderate success of the last three years and on the technique of finding oil. Wildcat drilling activity in California should not be allowed to decline.

Outlook for Future Discoveries.—The improved rate of oil discovery during the last three years and present information as to the geological possibilities of California strongly indicate that exploration, conducted in a consistent manner uninterrupted by periods of overproduction and instability, can provide an adequate supply of oil for many years.

ADDITIONS TO RESERVES DURING 1938

Additions to oil reserves are of two types: (1) geological discoveries of new fields and new zones, and (2) additions by reason of extension of area or the improvement of data provided by new wells in previously discovered fields.

New Oil Fields

Five new fields [1] were discovered in California during 1938. These additions

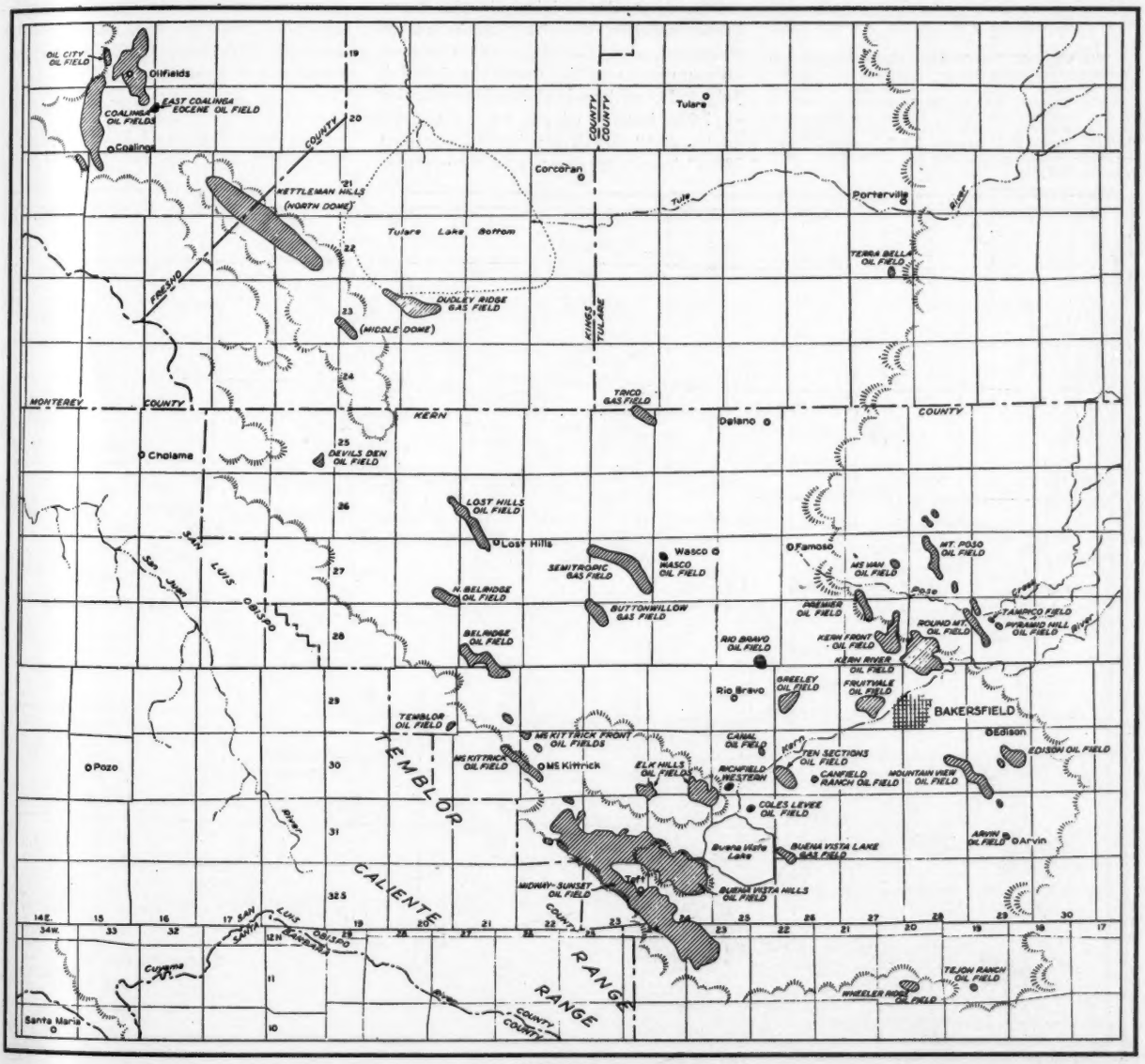

Fig. 2
Southern San Joaquin Valley showing oil fields; new discoveries and extensions shown in solid black.

to the state's oil reserve resulted from the individual and combined efforts of geologists and seismograph parties in mapping surface and sub-surface geology. Two fields, one of them a stratigraphic trap and the most important discovery in two years, resulted from the efforts of geologists in mapping surface and subsurface structure and stratigraphy; the remaining three were found by use of the reflection seismograph.

Wasco Field

Location.—Four miles west of Wasco and three miles east of Lost Hills field in Section 8, T. 27 S., R. 24 E.

Discovery.—Made by the Continental Oil Company on completion of its K. C. L. No. A-2 in April, 1938. The well was completed flowing through the tubing with a daily initial production of 1,722 barrels of oil on a 12-hour gauge, 34.7° A.P.I. gravity, 7.2 per cent cut, ⅜" bean, 1200-1500 pounds tubing pressure, 50-200 pounds casing pressure, 164 M.c.f. of gas. The cut cleaned up to 0.1 per cent. Total depth is 15,004 feet, plugged to 13,998 feet. The producing sand considered to be the Rio Bravo sand, lies between 13,100 and 13,175 feet. Before being completed this well, the deepest in the world, was drilled to 15,004 feet.

Development.—Two completions, two abandonments, and three locations.

Geology.—The structure is an anticlinal dome, apparently having comparatively small closure and areal extent.

Geologic method of discovery.—Reflection seismograph.

East Coalinga Eocene Field

Location.—Five and one-half miles northeast of the town of Coalinga and two miles southeast of the old Coalinga field in Section 18, T. 20 S., R. 16 E.

Discovery.—Made jointly by the Petroleum Securities Company, Seaboard Oil Company, and Honolulu Oil Company on completion of their well No. 1-18F in July, 1938, with an initial daily production of 7,920 barrels of oil on a one-hour gauge, 32.1° A.P.I. gravity, 0.1 per cent, 38/64" bean, 1100 pounds tubing pressure, 1375 pounds casing pressure, 7,000 M.c.f. of gas estimated. On the first 24-hour gauge the well flowed 753 barrels of oil, 33° A.P.I. gravity, 0.1 per cent cut, 12/64" bean, 1185 pounds tubing pressure, 1575 pounds casing pressure, 365 M.c.f. of gas. Total depth is 6,908 feet. The producing zone is Avenal (or Gatchell) sand of Eocene age between 6,710 and 6,908 feet.

Development.—Nine completions, five drilling wells, two locations, and two abandonments. The discovery well stopped in oil sand. One of the later wells penetrated a 600-foot zone containing 587 feet of remarkably permeable medium coarse oil sand.

Geology.—Oil accumulation occurs in a 600-foot body of Eocene sand, the updip edge of which cuts northeastward across the prominent southeastward plunging Coalinga anticline and is overlapped by younger beds of silty shale. Geologic Method of discovery.—Field mapping and subsurface studies.

Coles Levee Field

Location.—Eighteen miles southwest of Bakersfield and four and one-half miles

1. The Canfield Ranch area, discovered by the Standard Oil Company of California by completion of its K.C.L. No. 15-1 in January, 1938, is tentatively considered to be an eastern extension of the Ten Sections field. The initial daily production was 234 barrels of oil, flowing through a 16/64" bean, 27.5 degree A.P.I. gravity. The average daily production for December, 1938, was 41 barrels.

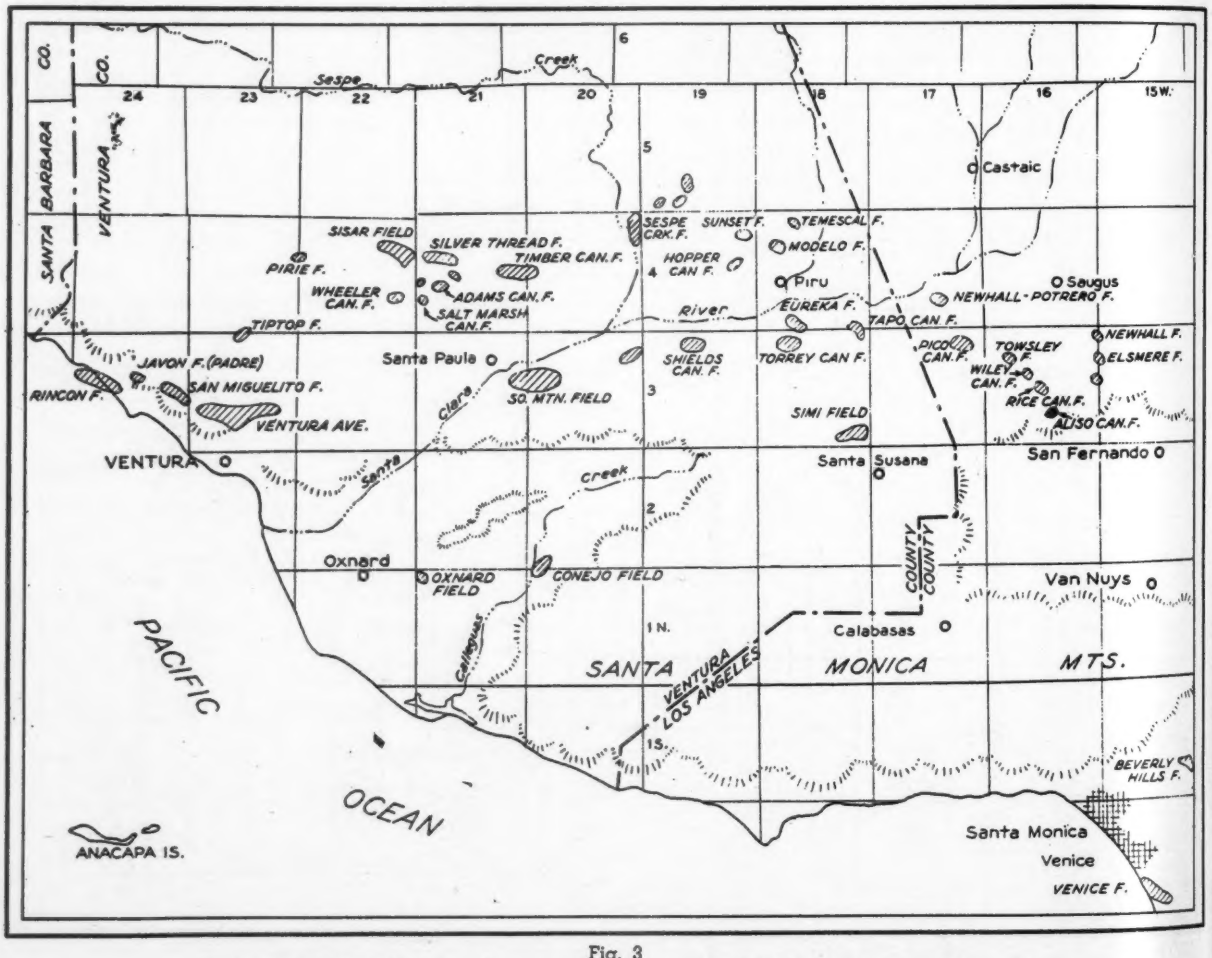

Fig. 3
Ventura-Newhall district, showing new Aliso Canyon (solid black) near San Fernando.

southwest of Ten Sections oil field in Section 10, T. 31 S., R. 25 E.

Discovery.—Made by The Ohio Oil Company on completion of its well KCL No. F-1 in November, 1938, with an initial daily production of 732 barrels of oil on a 16½-hour gauge, 44.5° A.P.I. gravity, 1.6 per cent cut, 48/64" bean, 475 pounds tubing pressure 900 pounds casing pressure, 3900 M.c.f. of gas. Total depth is 9,365 feet. The producing zone is the Stevens sand between 9,220 feet and bottom.

Development.—There are two locations in the area.

Geology.—The structure is probably some sort of eastward plunging anticlinal nose, with westward closure dependent on the presence of either one or more faults or a stratigraphic trap or both.

Geologic method of discovery.—Reflection seismograph.

Richfield-Western Field

Location.—One mile east of Elk Hills field and 18 miles southwest of Bakersfield in Section 32, T. 30 S., R. 25 E.

Discovery.—Made by the Richfield Oil Corporation on completion of its Western No. A-32-32 well on November, 1938, with an initial daily production of 3,752 barrels of oil on a 4-hour gauge, 44.1° A.P.I. gravity, 4.8 per cent cut, 1½" bean, 1000 pounds tubing pressure 1000 pounds casing pressure, flowing. Total depth is 8,677 feet. Producing formation is the Stevens sand between 8,250 and 8,677 feet. Due to high gas-oil ratio the discovery well was recompleted January 4, 1939, producing from 128 feet of zone between 8,523 and 8,677 feet. On January 15, 1939, a potential of 2,112 barrels a day of 44° gravity oil was established. Gas production was reduced from 15,000 M.c.f. to 7,000 M.c.f. by this recompletion. Pressures at the present curtailed production rate are 2950 pounds on the tubing and 2550 pounds on the casing.

Geology.—Judging from available data, accumulation is due at least in part to the presence of a closed anticlinal structure developed on a prominent nose immediately east of the Elk Hills anticlinal uplift.

Geologic method of discovery.—Reflection seismograph.

Aliso Canyon Field

Location.—Four and one-half miles south of the town of Newhall and six miles northwest of San Fernando, Los Angeles County, in Section 27, T. 3 N., R. 16 W.

Discovery.—Made by the Tide Water Associated Oil Company on completion of its Porter No. 1 in October, 1938, with initial daily production estimated at 1,000 barrels of oil. On a potential test

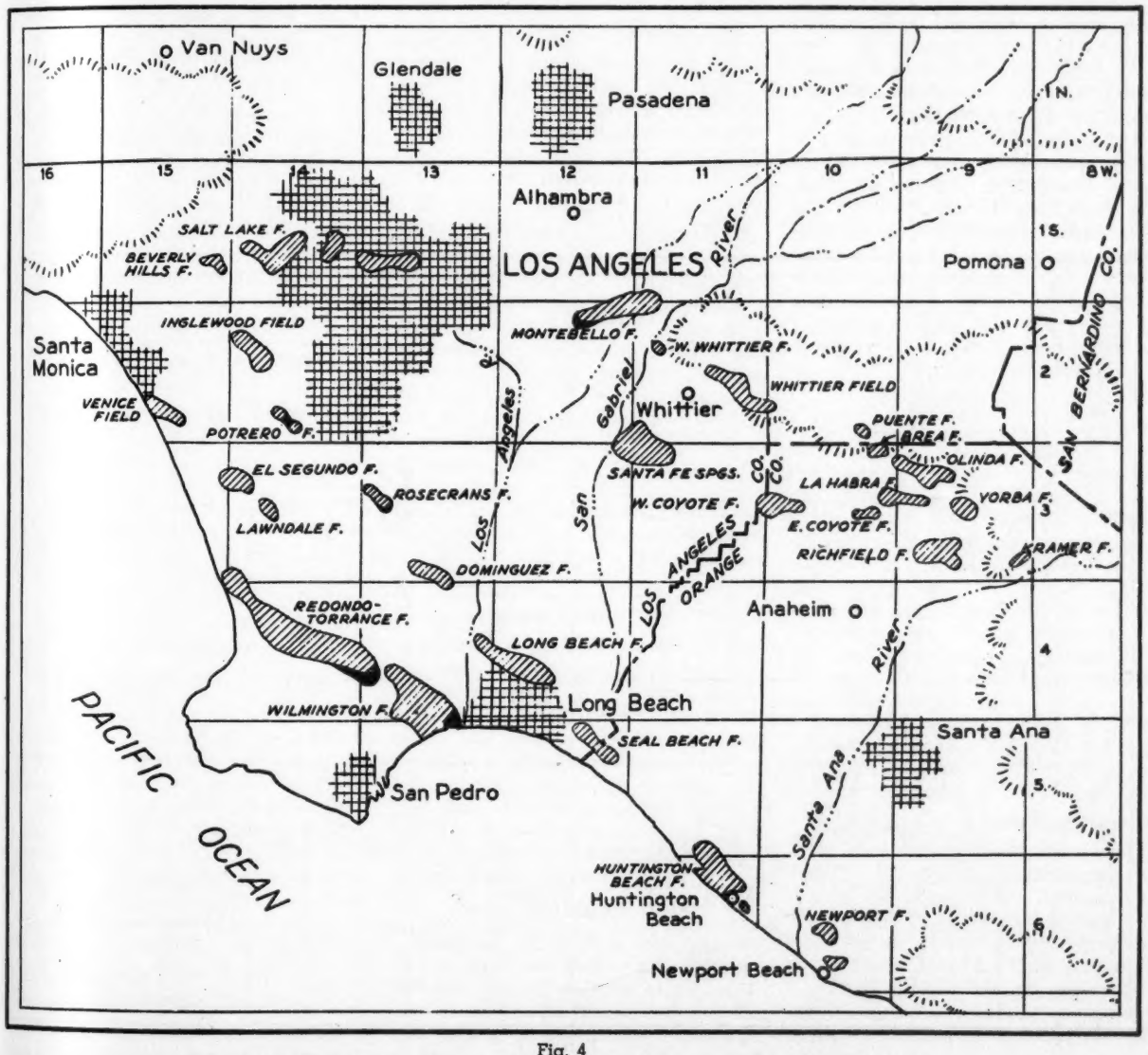

Fig. 4
Los Angeles Basin fields with new discoveries and extensions shown in solid black.

the well flowed 1,200 barrels a day of 24.2° A.P.I. gravity, 0.7 per cent cut, 40/64" bean, 150 pounds tubing pressure, 1300 pounds casing pressure. Total depth is 5,393 feet. Producing from 598 feet of zone from 4,795 feet to bottom.

Development.—Three locations.

Geology.—Oil accumulation occurs in Middle Pliocene beds lying directly beneath what is presumed to be a north-dipping thrust fault. The structure of the producing beds beneath the fault is as yet unknown.

Geologic method of discovery.—Discovery was made on the basis of geologic field mapping.

New Zones in Known Oil Fields

New producing zones were discovered in five fields during 1938, the most important of which was the Vedder zone of the Greeley field. New zones in two other fields, Torrance and Montebello, were rapidly developed and provided considerable areal extension of these older fields. A new zone in the Signal Hill area of the Long Beach field proved productive but not at a rate considered commercially profitable for its depth. The northwest extension of the Long Beach field (Hilldon area) obtained its first Miocene production by the discovery of a new and deeper zone.

Greeley Field

The Vedder zone, lying 3,600 feet below the previously productive Greeley zone, was found to be capable of prolific production. This discovery was made by the Standard Oil Company in June, 1938, on completion of its K. C. L. No. 11-2 at a depth of 11,520 feet. Initial daily production was 6,408 barrels of oil, 37° A.P.I. gravity, 0.1 per cent cut, 96/64" bean, 375/0 pounds pressure, 4,855 M.c.f. of gas, flowing. The producing zone lies between 11,396 and 11,520 feet and is correlative with the Vedder zone (Lower Miocene) of the nearby Rio Bravo field.

Torrance Field

Considerable activity developed along the south flank of the Torrance field after the Chanslor-Canfield Midway Oil Company completed its Torrance No. 33 in January, 1938, for 161 barrels of 27° gravity oil from the Del Amo (Miocene) zone. This zone had been previously discovered by the C. C. M. O. Company on their Del Amo lease, but production was not sufficiently large to encourage further development. On December 29, 1938, there were 166 wells producing 10,990 barrels of oil per day from the Del Amo zone. The depth is approximately 5,000 feet, and the gravity of the oil ranges from 22° to 30.2° A.P.I. Due to the close spacing of wells, the thinness of the zone, and the lack of proper curtailment, most wells have developed water troubles.

At the end of 1938 there were 36 wells producing a daily average of 3,481 barrels of oil in the Harbor City area of the Torrance field. The extension was due to the completion of the D. & B. Oil Company No. 1 well with an initial daily production of 663 barrels of oil, 29.5° A.P.I. gravity, 15 per cent cut, 40/64" bean, 50-60/340 pounds pressure. The cut later reduced to 0.5 per cent. Total depth is 5,275 feet, producing from 155 feet of zone from 5,120 feet to bottom. The producing zone has an average thickness of 150 feet, approximately one-half of which is oil sand.

Montebello Field

Three new oil zones were discovered at the western end of the Montebello field. Development of these zones provided considerable areal extension of the producing limits of the field.

Activity in this area was started by the discovery of the sixth zone by the St. Helens Petroleum Corporation in January, 1938, when it completed Monterey No. 20 for an initial daily production of 1,700 barrels of oil, 38° A.P.I.

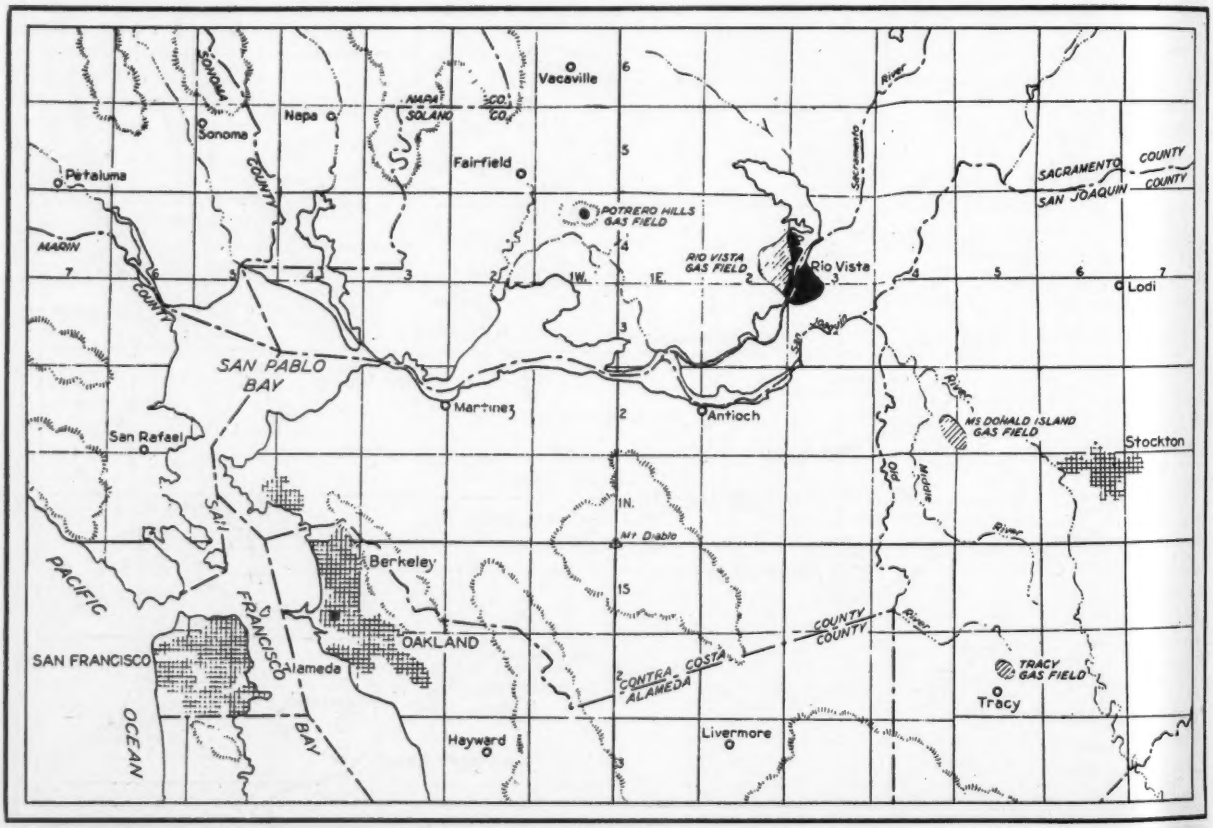

Fig. 5
Gas fields of San Francisco--Stockton area showing new Potrero Hills field and extension of Rio Vista field in solid black.

gravity, 1 per cent cut, 66/64" bean, 500 pounds tubing pressure, 1200 pounds casing pressure, 8670 M.c.f. of gas, flowing. Total depth is 6,353 feet and production comes from 20 to 30 feet of sand in a 130-foot zone (Upper Miocene) between 6,221 and 6,353 feet.

Subsequent wells proved the existence of two additional zones, the fifth a higher zone in the lower part of the Pliocene between depths of 5,400 and 5,800 feet, and the seventh a lower zone in the Miocene between 7,000 and 7,200 feet. By the close of the year 32 wells with initial daily productions of between 250 and 3,300 barrels had been completed in one or more of these zones.

Production from these new zones is confined to the so-called West Montebello field and is believed to be trapped in this area by a northerly trending fault which cuts across the westward plunging Montebello anticline.

Long Beach Field

A new deep zone of doubtful economic value was discovered in the Signal Hill area of the Long Beach field by the De Soto Oil Company. Its No. 1 well was completed in December, 1938, for an initial daily production of 250 barrels of oil, 28.0° A.P.I. gravity, 2.5 per cent cut, 43/64" bean, 120 pounds tubing pressure, 540 pounds casing pressure, on compressor. Total depth is 10,157 feet with production coming from 398 feet of Miocene sand and shale between 9,710 and 10,157 feet.

Northwest Long Beach Field ("Hilldon" area)

The northwest extension of the Long Beach field, discovered in 1937 by the Hilldon Oil Company, obtained its first Miocene production in July, 1938, when the Hilldon Oil Company completed its Dominguez No. 1 in a new zone between depths of 7,710 and 7,788 feet. Initial daily production was 840 barrels of 23.9° A.P.I. gravity oil, 0.1 per cent cut, 56/64" bean, 1,700 M.c.f. gas, and 170 pounds casing pressure.

Extensions of Known Oil Fields

Extensions of known fields during 1938 have added an estimated 110 million barrels to the state's oil reserve. These extensions of previously discovered fields add nothing to the oil discovery column for 1938 (Fig. 6) but rather to the columns for the preceding years in which these fields were discovered. The reserves made apparent by these extensions together with those estimated for the new fields of 1938 constitute the total additions to reserves for the 1938 column of Figure 1.

Wilmington Field

The Wilmington field was extended one mile to the southeast, into the western edge of the City of Long Beach, by the completion of Superior Oil Company 1960 Community No. 1 well in January, 1938. Initial daily production was 3,917 barrels of oil, 23.6° A.P.I. gravity, 3.9 per cent cut, 60/64" bean, 220 pounds casing pressure, 46/64" bean, 60 pounds pressure. Total depth is 4,028 feet, plugged to 3,890 feet. This area, actively developed in the Terminal and Ranger zones during the first half of the year, added materially to the proved area of the field.

Rosecrans Field

The O'Dea zone of the Rosecrans field, discovered in 1937, underwent continued active development during 1938. Potential and actual daily production, proved area, and known reserves for this zone were materially increased. Producing wells in this zone totaled 36 at the end of the year, most of which were characterized by large daily yields.

Torrance Field

The Torrance field experienced considerable extension southeastward during 1938 by reason of the discovery and development of a new and deeper oil zone. This new zone development is described on page 8 under the heading of new oil zones.

Potrero Field

The Potrero field, a small and inactive Los Angeles Basin field immediately southeast of Inglewood, had one new completion in May, 1938, which may encourage further development. The Basin Oil Company's new well, Potrero No. 1, was good for an initial daily production of 600 barrels of oil, 50° A.P.I. gravity, 1 per cent cut, 21/64" bean, 375 pounds tubing pressure, 925 pounds casing pressure, 300 M.c.f. of gas, flowing. Total depth is 4,741 feet, plugged to 4,666 feet. Production was obtained by gun-perforating opposite a 10-foot Lower Pliocene oil sand 4,628 and 4,638 feet. Success in this area is hindered by the close association of oil sands and water sand.

Ventura Avenue Field

Operators of the Ventura Avenue field have been successful during 1938 in extending the producing area of some of the deeper zones along the north flank of the central and eastern parts of the field. Depths of producing zones in more recent wells generally range between 8,000 and 9,000 feet. The Associated Oil Company completed its McGonigle No. 11 at a depth of 10,935 feet for 1,631 barrels of 29° gravity oil from 490 feet of zone.

West Cat Canyon Field

The West Cat Canyon field has long been comparatively inactive but in August, 1938 was extended one mile to the southwest on completion by the Standard Oil Company of its Las Flores No. 1 well in Section 27, T. 9 N., R. 33 W. Initial daily production was 450 barrels of gross oil, 14° A.P.I. gravity, 4 per cent cut, pumping. Total depth is 6,556 feet, plugged to 6,440 feet. The producing formation is Monterey shale. Due to the present limited demand for this quality crude no active development is expected to result from this extension.

Other Fields

Several of the more important fields discovered during the last two years have been extended by normal development during 1938. The most important of these are Canal, Rio Bravo, and Newhall-Potrero. Although these extensions were expected and call for no particular discussion here, they contributed materially to the quantity of oil reserves added during the year.

New Gas Fields
Willows Gas Field

The Willows gas field, located along the west side of the Sacramento Valley, Section 18, T. 20 N., R. 2 W., 135 miles northeast of San Francisco, was discovered by the Ohio Oil Company on completion of its Willard No. 1A in August, 1938, with an initial daily rate of 5,356 M.c.f. of gas, through a 21/32" bean, 515/600 pounds pressure. Total depth is 6,014 feet in Cretaceous, plugged to 2,247 feet. Production is obtained through perforations opposite a 10-foot Cretaceous sand between depths of 2,237 and 2,245 feet. The well is now shut in.

Accumulation in this area occurs in closed anticlinal structure discovered by use of the reflection seismograph.

Potrero Hills Gas Field

A fifth gas field was added to Northern California in December, 1938, when the Richfield Oil Corporation completed its Potrero Hills No. 1 well in Section 10, T. 4 N., R. 1 W., 40 miles northeast of San Francisco. The initial daily production was 5,000 M.c.f. of gas, through 16/64" bean, with 475 pounds tubing pressure and 990 pounds casing pressure. Total depth is 5,334 feet, plugged to 3,265 feet. Production is obtained from 40 feet of Cretaceous sand between 3,225 and 3,265 feet.

The discovery well was drilled on the axis of a prominent east-west trending anticline exposed in Eocene and younger Tertiary formations.

Extension of Known Gas Fields

The Rio Vista gas field was extended 2½ miles to the southeast on the completion by the Standard Oil Company and The Texas Company of their Midland Fee No. 1 in July, 1938. The initial flow was at the rate of 24,443 M.c.f. of gas 64/64" bean, 1025 pounds flow pressure. This field now contains about 9,000 proved acres and is the largest field producing only gas in the state.

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Resume of Geological Discoveries

Geological discoveries of new fields and new zones in 1938 added an estimated 143 million barrels to the known oil reserve of the state (Fig. 6). Present estimates are conservative and will be annually increased by extended development of these new fields in future years. New oil reserves discovered in the preceding year of 1937, as estimated at the close of that year, amounted to 125 million barrels but have been increased by normal development during 1938 to an estimated 214 million barrels. Discoveries of earlier years have been increased by smaller amounts during 1938.

The East Coalinga Eocene field appears to be the most important discovery of the year. It is probable that this stratigraphic overlap with a known thickness of 587 feet of unusually permeable medium coarse oil sand will yield two or three times the quantity of oil that can be credited to it now with the present limited distribution of wells.

The Wasco field, discovered by the deepest well in the world, is probably small in area but is limited in estimated reserves primarily by the known presence of only 40 feet of oil sand.

The Coles Levee, Richfield-Western, and Aliso Canyon fields are all fields of at least moderate importance. Known thicknesses of oil and gas sand in these fields are 115 feet, 238 feet, and 245 feet, respectively, and in each case the discovery well stopped in oil sand.

Geological Exploration and Wildcat Drilling

Figure 7 shows a close correlation between the quantity of oil discovered and the combination of geological activity and wildcat drilling. The curve of wildcat drilling is declining and that for geological activity is tending to flatten. Continuation of these trends, if past experience is accepted as a reliable guide, should ultimately lead to a decline in the discovery rate. Past serious declines in the discovery rate, such as that during the period from 1931 to 1936, are obviously the result of a comparable decline in exploration activity.

Ninety-five per cent of the new discoveries in California are made by large companies supported by sizeable and competent geological staffs. Few, if any, lucky accidents appear in the oil discovery record of the past 20 years and, during the last decade, only one sizeable discovery has been made by an independent operator. This is due principally to the expense attached to adequate geological exploration and the drilling to depths now generally required.

The reflection seismograph continues to be an important, almost indispensable, tool in geological exploration in this state. This instrument under geological guidance accounted for three of the five new fields of 1938, while field and subsurface geology were responsible for the other two.

Overproduction and Discovery Rate

An excessive capacity to produce or the

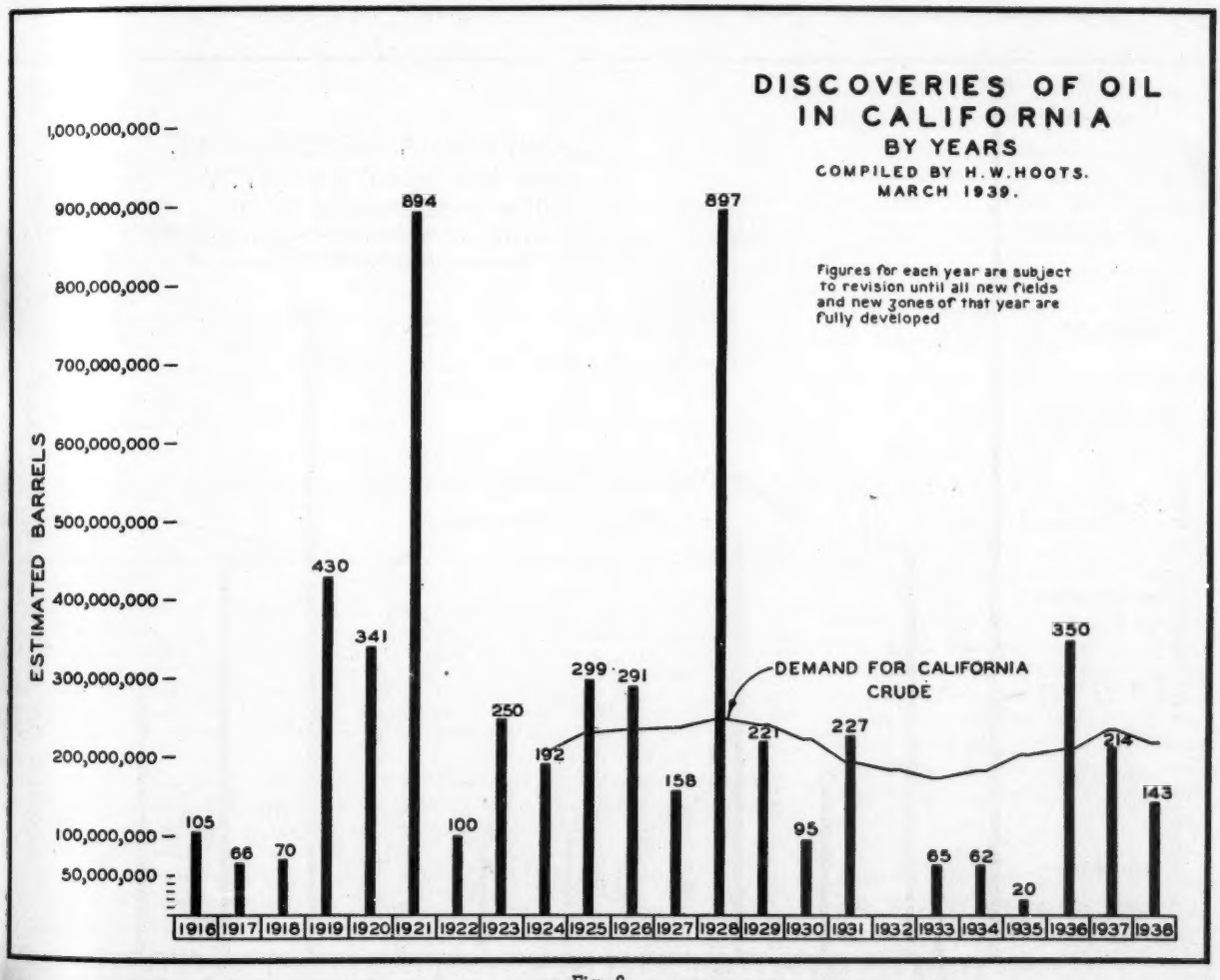


Fig. 6

Discoveries of oil in California by years. Figures for each year are subject to revision until all new fields and new zones of that year are fully developed. See Figure 1 for list of discoveries in 1938. Demand figures for 1924-1937 inclusive are calculated on a two-product (crude and gasoline) basis while those for 1938 are on an all-product basis.

actual production of excessive quantities of oil discourages the search for, and discovery of, reserves important to the future welfare of the industry. The present rate of discovery of additional reserves, although keeping pace with consumption, is not satisfactorily augmenting our decreased reserve supply and should be increased. The rapidity of drilling wells in new fields and the resulting excessive production or capacity to produce interferes with normal exploration and a desirable rate of discovery.

California for more than a year has faced an overproduction situation of such magnitude as to seriously threaten profitable operation. Production has been rapidly filling available storage and the greatly increased capacity to produce has required that the maximum daily allowable for new wells be cut in half. This condition exists in spite of the fact that new discoveries in terms of total reserve supply have not been excessive in any year during the last decade.

Overproduction does not necessarily result from the discovery of new fields but rather from the drilling of an excessive number of new wells in these new fields and the insufficient curtailment of their production. The curves of Figure 8 offer comparisons between reserves of California and the United States, between California reserves and demand, between potential production, number of new producing wells completed, and demand, and between California reserves and the number of producing wells.

It is clear that the estimated capacity to produce has been developed far in excess of daily requirements of about 600,000 barrels and, during the past year, has almost doubled in spite of a 15 per cent reduction in the number of wells completed. It is equally clear that the ability to produce is developed independently of the discovery of new reserves, the yearly average of which for the last three years is almost identical to the average annual demand.

The success of discovery during the last three years has vastly improved over that for the preceding four years and is due entirely to improved technique in exploratory methods and a constructive attitude toward the necessity for additional reserves.

Increasing demand for oil and the relatively low position of our total known oil reserves require that continuous effort be expended to improve on the encouraging but moderate success of the last three years and on the technique of finding oil. The time factor invariably associated with the necessary research for, and the practical application of, new exploratory methods, together with the loss of efficiency in discontinuous effort cannot be over-emphasized.

Continuation of costly exploration for new reserves is essential but is periodically discouraged by excessive daily supply and attendant threats to price structure. This trend is continued until the supply dwindles and a shortage is threatened. The cycle of renewed exploration, discovery, and the development of excessive production then begins anew.

Any change in present conditions which will lead to less violent fluctuations in this cycle and greater stability throughout the industry is desirable. This may be

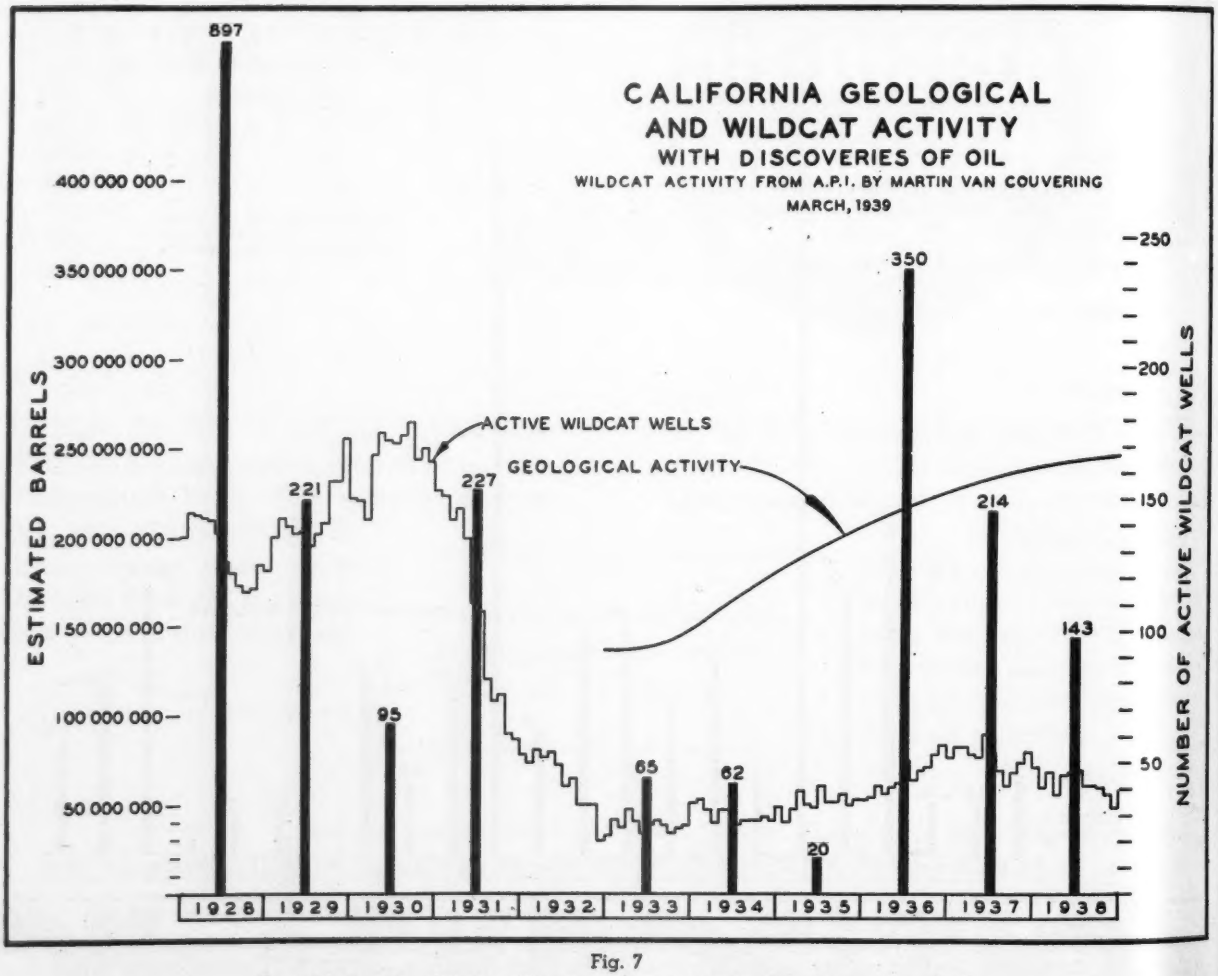


Fig. 7
Geological and wildcat drilling activity compared with discoveries of oil.

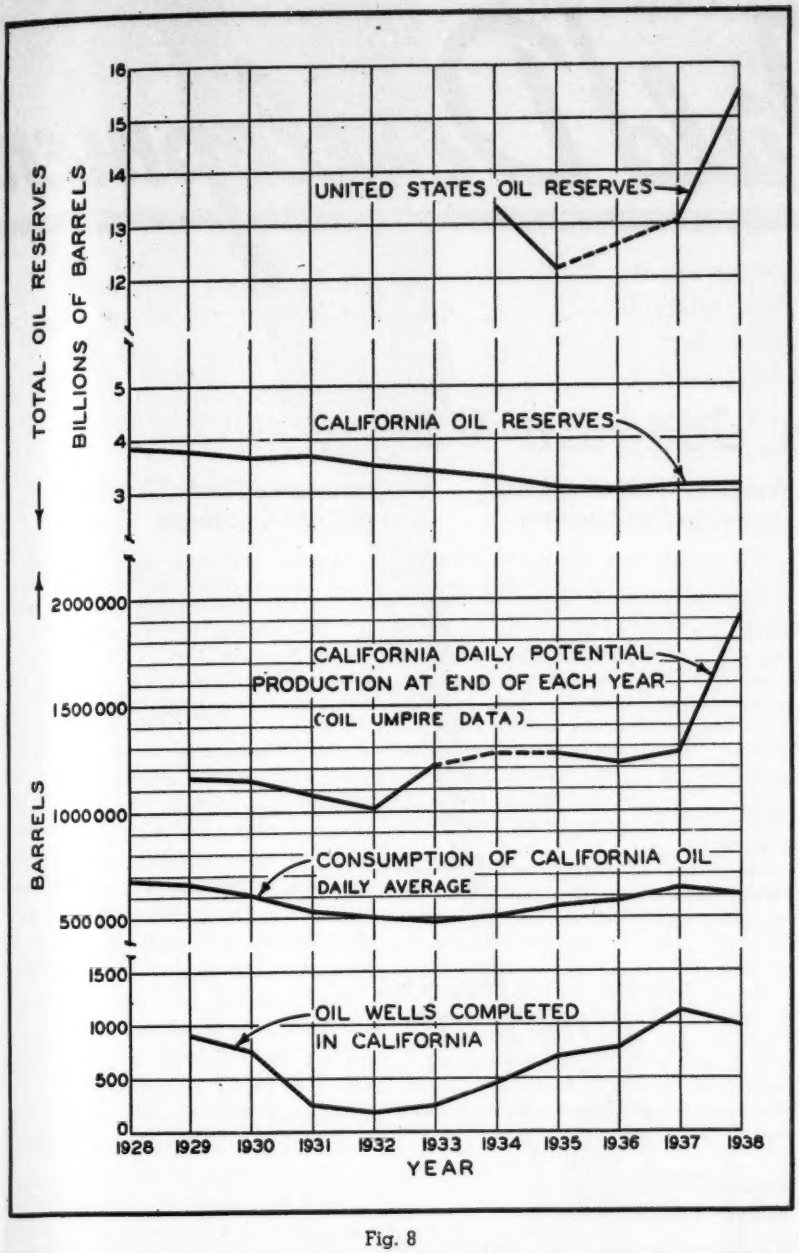


Fig. 8

Comparative curves showing (1) that California oil reserves, although considerably lower than 10 years ago, have been increasing slightly for the past two years; (2) that increase in oil reserves during the last two years corresponds to a general increase in consumption; and (3) that the number of wells completed annually during the last six years has increased from 184 in 1932 to 995 in 1938, and that the potential production developed in the last year far exceeds the quantity necessary to meet present requirements as indicated by the consumption curve.

accomplished by increased curtailment of production or relief from the requirement to drill and produce during periods of threatened over-supply. Under the resulting more stabilized conditions exploration for needed additional reserves can proceed with greater efficiency.

Acknowledgments

The writer is indebted to many California geologists for their cooperation in providing data, to W. R. Wardner of the California oil umpire office for statistics, and to Mrs. Daisy Hansen for assistance in compiling.

Announcing that he will again present his oil marketing divorcement bill to the Senate, Senator Guy M. Gillette of Iowa says he hopes to have this presented in time so that it is certain to reach the floor for early consideration.

Shell Companies Announce Merger

Shell Oil, operating in the ten western states and Hawaii, and Shell Petroleum Corp., operating in the middle west and south, were merged April 1, according to announcement from the offices of Shell Oil Co. in Los Angeles. The name of the new corporation will be Shell Oil Co., Inc. The new corporation will acquire the marketing operations of Shell Union Oil Corp. in New England and the Atlantic states so that, from now on, Shell Union's operating company will cover the country from coast to coast.

The officers of the new corporation will be: R. G. A. Van Der Woude, chairman of the board; S. Belither, vice chairman of the board; Alexander Fraser, president, St. Louis; S. Belither, executive vice president, San Francisco.

Vice presidents, St. Louis: F. A. C. Guepin, H. H. Anderson, R. P. Bascom, E. D. Cummings, A. J. Galloway, P. E. Lakin, R. B. Roark, and T. E. Swigert.

Vice presidents, San Francisco: F. S. Clulow, E. F. Davis, D. Heggie, L. G. McLaren, J. U. Stair.

Vice president, New York: L. T. Kittinger.

J. W. Watson, treasurer; J. T. Dickerson, secretary, St. Louis; A. R. Bradley, assistant secretary, San Francisco; E. C. Peet, assistant treasurer, San Francisco.

A.P.I. Spring Meet To Draw Record Crowd

A record attendance is anticipated for the Annual Spring Meeting of the Pacific Coast District, Division of Production, American Petroleum Institute, to be held in Los Angeles, April 11.

Advance news of the Annual Banquet program for the evening session in the Los Angeles Biltmore Bowl has caused an early flood of ticket reservations.

Tickets may be secured at the Los Angeles headquarters of the A.P.I., 510 West Sixth Street, $1.75 per person.

Additional ticket offices have been established in Long Beach—F. R. Schmieder, Shell Oil Co.; Ventura—A. W. McLean, General Petroleum Corp.; Bakersfield—George Suman, Tidewater Associated Oil Co.; Taft—Mal Morris, Standard Oil Co.

Lane-Wells Executive Recovering Appendectomy

Rodney S. Durkee, executive vice-president of the Lane-Wells Co., is in the St. Joseph's Hospital, Santa Ana, Calif., recovering from the loss of his appendix.

Field Development

San Joaquin Valley

Lytle Gets New Eocene Pool Production

Well No. 22-18F was brought in flowing a 3400 bbl. rate by Robert S. Lytle, operator for the Petroleum Securities interests. The well, located in sec. 18, 20-16, made clean 32 gravity oil with better than a million and a half feet of gas. Preparations are being made to spud No. 3-18F on the same section.

Mr. Lytle spudded No. 62-7F in sec. 7, 20-16 on the 27th of March and was last drilling well below 3000 ft. No. 31-7F in section 7 is redrilling below 5500 ft. in hard shale.

An excellent well was obtained by Standard Oil Co. in No. 71-13C, most westerly project to be completed. Located 330 ft. south and 990 ft. west from the northeast corner of sec. 13, 20-15, the upper 65 ft. section of the Gatchell sand was missing, the grit zone being placed at 6610 ft. and the top of the oil sand at 6765 ft. The hole was bottomed in the lower silt at 6945 ft., the thinness of the Gatchell sand indicating a close proximity to the shore line marking the westerly limits of production. On a short flow test before shutting in, production of the well was estimated at 4000 bbls.

Superior Oil Co. Coalinga Fee No. 4 was completed for 2700 barrels daily after topping the Gatchell at 7743 ft. Coalinga Fee No. 3, immediately north of No. 4 in sec. 7, 20-16, is drilling below 7900 ft. in oil sands and should be the next field completion. Superior is making plans to drill Cagle No. 2 in sec. 6, 20-16 near the site of Cagle No. 1 which made the first important northerly extension.

Exeter No. 1, in sec. 6, 20-16, operated by The Texas Co. is in hard gray shale below 6400 ft.

The Holly Development Co. project in sec. 12, 20-15, previously reported as well No. 1, is to be known as No. 82-12C and has not yet been started.

Western Gulf Continues Fruitvale Prospecting

With a well for a well policy, Western Gulf Oil Co. makes a location in exchange for an abandonment. Failing to extend the field to the north, the next try will attempt to jump production a mile to the south. The northern outpost, bottomed in sandy shale at 3899 ft., in sec, 14, 29-27 and known as KCL-Fruitvale No. 1, showed only mud on a formation test of the interval 3348-3544 ft. The Santa Margarita was found at 3765 ft. and the project was abandoned Mar. 29.

Operations in the field were then transferred to a southerly outpost to be known as KCL-Bellevue No. 1 in sec. 34, 29-27. The try was last reported as grading.

Pacific Southwest Oil Co. Well No. 1, sec. 14, 29-27 is below 3900 ft. in green siltstone. The Martin zone was found at 3789 ft. and drilling is expected to carry into the Kernco. The sands encountered above the Martin did not warrant formation tests.

Canal Test Drills Below 13,000 Ft.

Shell Oil Co. KCL No. B-87-4, deep test lying 2 miles northwest of Canal field production, is drilling in hard shale below 13,143 ft. The well, in sec. 4, 30-25, has encountered only hard shale and barren sand in the last 3000 ft. of digging. In December a formation test of the interval 10,236-10,296 ft. recovered small quantities of high gravity oil with fresh water and very little gas. B-87-4 is the deepest hole drilled by Shell in California.

Within the field, Shell is drilling KCL No. A-23-14, sec. 14, 30-25, below 8300 ft. No. A-36-14 in the same section is a rig only.

Ohio Oil Co. KCL No. E-11, same section, drills in sand and shale with bottom last reported as 7424 ft.

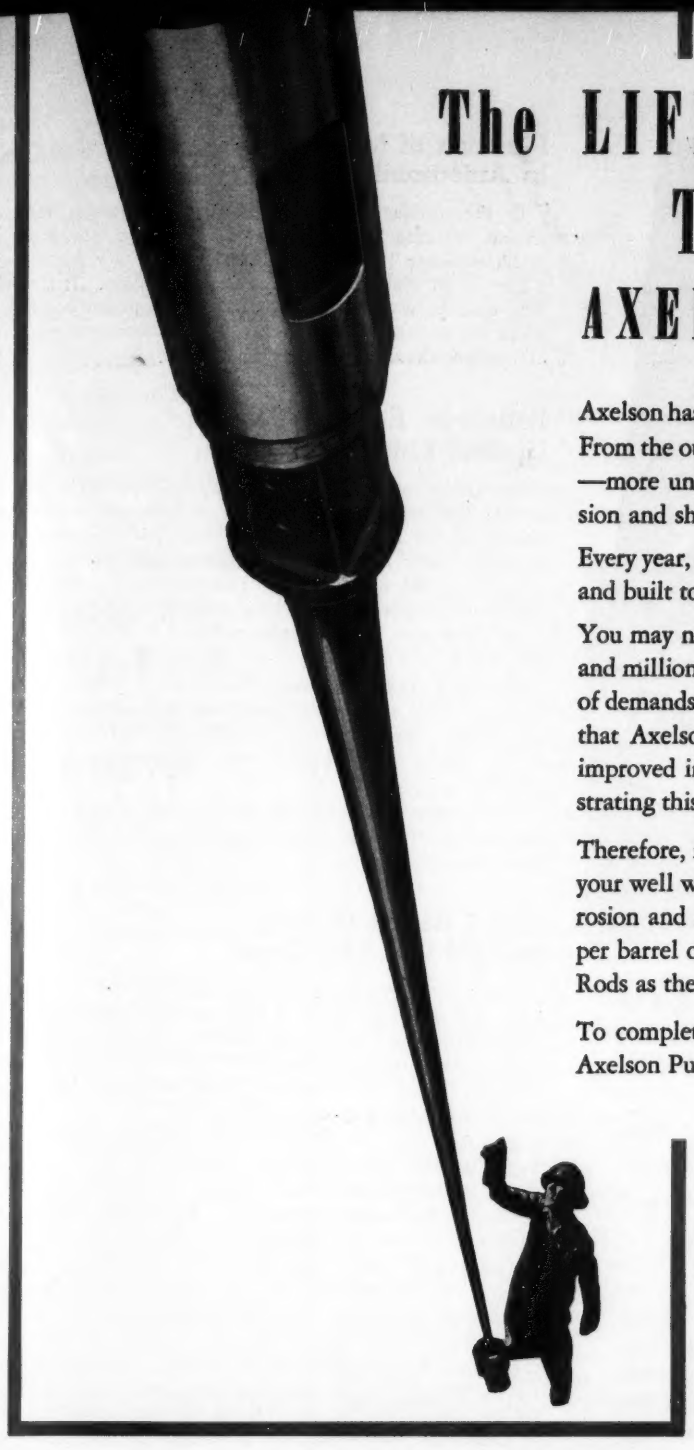
Amerada Finds Gatchell In East Coalinga "Cat".

Opening new vistas in the East Coalinga district, Amerada Petroleum Corp. topped the rich Gatchell sands at 8037 ft. The horizon top was found 250 ft. deeper than in the Superior Oil Co. Hight No. 1, 5 miles due south of the new strike. The well, known as S.P.L. No. 7-17, in sec. 17, 19-16, is 2 miles east of East Coalinga old production and 4 miles north of the present Eocene development. Acreage surrounding the new find consists of large blocks, hundreds of acres of which are held by Amerada. Union Oil Co. and Standard Oil Co. also hold adjacent leases. Bandini Petroleum, R. L. Peeler and L. V. Smith hold acreage nearby.

The discovery lies in an area which has been little prospected prior to the current try. Nearest deep exploration was the Tidewater Associated Oil Co. Fleishacker No. 1, which was drilled more than 2 miles northwest and carried to 7378 ft. finding no oil sand.

Since the deposit is a shoreline accumulation, the physical limits of the structure cannot be determined without much additional drilling to establish shoreline edges. The nature of the structure, coupled with geologic experience in the area, seem to indicate that the discovery is an extension of the East Coalinga Eocene field rather than a separate closure.

Water string is being run with bottom at 8082 ft. prior to a production test. Oil field operators who have followed the Amerada activities are hoping for successful tests to culminate the try. These hopes are prompted by the consistently bad luck which has followed the company's efforts to locate oil.



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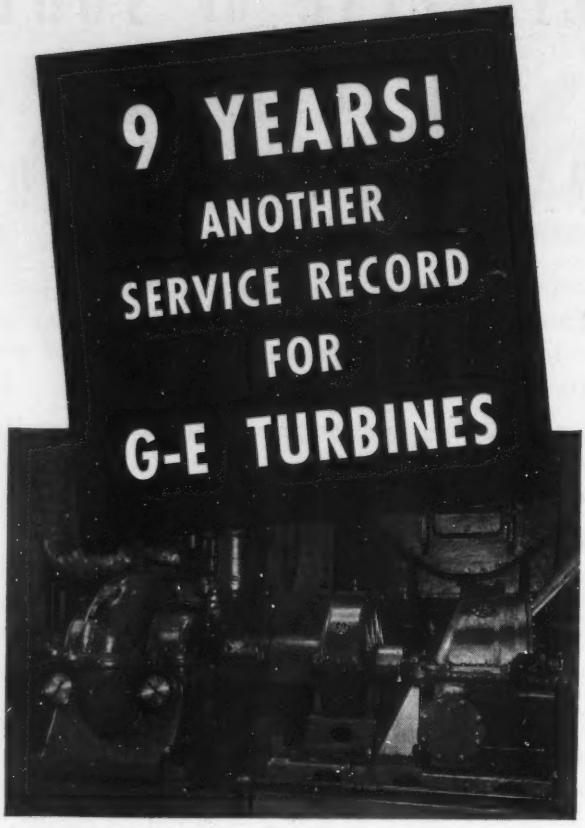

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Petroleum Refining Pays Highest Entrance Wages

Petroleum refining leads 20 large industries in entrance rate of pay for unskilled workers, it is indicated in the annual survey of the Bureau of Labor Statistics. The survey, published recently as of July 1, 1938, shows that the entrance rate of pay for laborers in 16 manufacturing industries, three public utilities, and in building construction, averages 51c an hour. The rate for petroleum refining is 67½c in the North and 57c in the South.

Second to petroleum was 63.5c paid by building construction, and 59.5c paid by iron and steel and by chemicals, all in the North. Nearest to petroleum's 57c entrance wage rate in the South was the 49.5c rate of slaughtering and meat packing.

The survey developed that 78 per cent of common laborers received from 40c to 67½c per hour at the time of starting on a job.

A. P. I. Names Central Natural Gas Test Group

F. E. Rice, Phillips Petroleum Co., Bartlesville, Okla., has been appointed chairman of the Central Committee on Measuring, Sampling and Testing Natural Gas and Natural Gasoline of the American Petroleum Institute's Division of Production. E. R. Lederer, Bradford Refining Co., Bradford, Pa., is vice chairman of the committee.

Members are: M. J. Adams, The Texas Co., Fort Worth, Tex.; W. W. Baker, Sinclair Prairie Oil Co., Tulsa, Okla.; E. H. Blum, The Atlantic Refining Co., Dallas, Tex.; George P. Bunn, Phillips Petroleum Co., Bartlesville, Okla., and B. R. Carney, Shell Petroleum Corp., Tulsa, Okla.

Also Frank Chase, Lone Star Gas Co., Dallas, Tex.; J. J. Conroy, The Carter Oil Co., Tulsa, Okla.; **C. D. Gard, Union Oil Co. of California, Santa Fe Springs, Calif.**; J. B. Garner, Hope Natural Gas Co., Pittsburgh, Pa.; D. Greenslade, Gulf Oil Corp., Tulsa, Okla.; R. D. Hanley, Magnolia Petroleum Corp., Dallas, Tex.; R. H. Hargrove, United Gas Public Service Co., Houston, Tex., and **Alois Kremser, Standard Oil Co. of California, San Francisco.**

Also William F. Lowe, Natural Gasoline Association of America, Tulsa, Okla.; H. M. Manley, Barnsdall Oil Co., Tulsa, Okla.; **D. R. Merril, Union Oil Company of California, Wilmington, Calif.**; Ray E. Miller, Hanlon-Burnhanan, Tulsa, Okla.; **William Moeller, Jr., Southern California Gas Co., Los Angeles, Calif.**; G. G. Oberfell, Phillips Petroleum Co., Bartlesville, Okla.; E. L. Peck, Cities Service Oil Co., Bartlesville, Okla.; F. M. Seibert, Gulf Oil Corp., Houston, Tex.; S. S. Smith, Shell Petroleum Corp., St. Louis, Mo.; J. O. Sue, Humble Oil and Refining Co., Houston, Tex.; and M. B. Swetney, Sun Oil Co., Dallas, Tex.

Also T. E. Swigert, Shell Petroleum Corp., Houston, Tex.; M. E. Wagner, The Ohio Oil Co., Tulsa, Okla.; P. G. Weidner, Standard Oil & Gas Co., Tulsa, Okla.; and **Frank Wells, Pacific Gas & Electric Co., San Francisco, Calif.**

North Dome Operations Maintain Steady Pace

Field operations are being carried on at Kettleman North Dome at its usual consistent pace. Thirteen strings are going at present with bottoms ranging from 5000 ft. to 10,000 ft. One project is rigging up and 5 rigs are standing ready for machinery. Locations are made for 5 additional holes as outfits are made available. The Kettleman North Dome Assn. and the Standard Oil Co. are sharing the activity honors about evenly.

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SAN JOAQUIN VALLEY WILDCATS

Fresno County

Area	Well	No.	Section	Depth	Status
Cantua Creek	Shell Oil Co., Port Costa	48–30	30, 17-16		Rig
Coalinga	Amerada Pet. Corp., SPL	7–17	17, 19-16	8080	Drilling
	American Oil Fields, Inc.	1	16, 19-15	250	Idle
	Foreign Oil Co.	6	6, 21-15	2540	Idle
	Jarvis, Leo P.	2	14, 20-14	805	Cleaning out
	Progressive	3	20, 19-15	852	Idle
	Roco Oil Co. Lindblom	1	3, 20-14	250	Drilling
	Rylatt, Harry E., Kipling	3	26, 20-14	1255	Drilling
	Stuart Oil Co., Stuart	1	12, 21-14	1455	Drilling
	Fresno Area, Seth Turner	1	4, 14-19		Rig
Jacalitos Hills	Dauphin Dev., Ragan	1	30, 21-14	4587	Idle

Kern County

Arvin	Superior-Standard-Texas, Jewett	1	16, 31-29	6270	Producing—Shut-in
	Superior Oil Co., P.D. Jewett	1	16, 31-29	6239	Drilling
	The Texas Co., Jewett	1	16, 31-29		Rig
	Univ. Consol. O. Co., Univ-Derby	1	15, 31-29		Foundation
Belridge	Honolulu Oil Corp., Michelssen	63	14, 28-20	1687	Testing
Buena Vista	Gen. Pet. Corp., B.V.A.	1	1, 32-24		Foundation
Buttonwillow	Calif. Explor. Co., Salisbury	1	7, 29-24	12231	Drilling
Canal	Shell Oil Co., KCL	B-87	4, 30-25	13143	Drilling
Coles Levee	Ohio Oil Co.	KCL-F2	10, 31-25	9653	Drilling
	Ohio Oil Co.	KCL-F3	11, 31-25		Rig
	Richfield Oil Corp.	2nd B-14-3	3, 31-25		Rig
	Standard Oil Co.	KCL 20-1	9, 31-25	8585	Drilling
	Tide Water Associated	KCL-61	14, 31-25	1661	Drilling
	Union Oil Co., Kernco	1–11	11, 31-25	9715	Drilling
Delano	Atlas Pet. Co., Moore	1	7, 25-25	125	Drilling
Devil's Den	Amerada Pet. Co., Beer	6	21, 26-19	4591	Abandoned
	Luxton, W. L.	1	27, 25-18	635	Idle
Edison	Hillview Oil Co., El Tejon	1-A	11, 30-30	2661	Idle
	Renner & R.H.L. Oil Co.	1	27, 30-30	2600	Idle
Elk Hills	Richfield Oil Corp.	A-52-32	32, 30-25	8793	Drilling
	Standard Oil Co.	KCL 21-1	19, 30-25		Rig
Grapevine	Petrol Corp., Reserve	33–5	33, 11-19	8946	Idle
Kern River	J. L. Milburn	1	13, 29-28	1667	Abandoned
Lerdo	Shell Oil Co.	KCL A-23	2, 29-26	9657	Abandoned
	The Texas Co.	KCL 35-1	35, 28-26	8821	Abandoned
Lost Hills	California Lands, Occidental	2	24, 26-20	5623	Idle
McClung	Superior Oil Co.	KCL-12	3, 30-26	13131	Abandoned
	O. F. W. Oil Co., Villard	1	28, 26-28		Rig
Mt. Poso	Shell Oil Co., Glide	48–29	29, 27-28	2508	Idle
	Vendome Oil Co.	1	28, 26-28		Rig
Midway	Fried, Julius	1	34, 32-24	5035	Idle
Richgrove	Dilamar Oil Corp., Quinr.	3	15, 25-27	2823	Idle
Round Mountain	Round Mountain Co.	1	24, 28-29		Rig
	Spartan Oil Co.	1	32, 28-29		Rig
San Emigdio	Continental Oil Co.,	KCL F-1	5, 10-21		Grade
	Shell Oil Co.	KCL 1A-8-32	32, 11-22	1640	Drilling
Shale Hills	Abbots, Frank	7-1	7, 27-19		Rig
Strand	Continental Oil Co.	KCL D-2	14, 30-26		Grade
	Tide Water Associated Cont.	KCL-E-35-7	7, 30-26		Rig
Trico	Standard Oil Co., M.&L.	8–1	3, 25-23		Shut in OK
	Trico Oil & Gas	T&G 1	2, 25-23	2434	Testing
Upper Kern River	Kern Valley Drlg. Co.	1	4, 29-29		Rig
Wasco	Union Kernco	1–36	36, 27-24	11317	Drilling

Kings County

Strattford	P. W. Burnham & Assoc. Bartells	1	23, 20-20		Rig

Superior Drops McClung Wildcat

Superior Oil Co. has abandoned KCL No. 12 in sec. 3, 30-26. Drilled to a total of 13,131 ft., the well cored oil showings in the top of the Vedder zone at 11,120 ft. After drilling through the Vedder and finding the Avenal barren at 12,825 ft., the hole was plugged back to 11,230 ft. and casing perforated 11,130-11,155 for a formation test, which recovered salt water and mud without a trace of gas or oil. The hole was then plugged back to 9377 ft. for a test of the interval 9085-9115 ft., which yielded pure salt water. The try was terminated on Mar. 27.

Superior has persistently prospected this area. Having drilled KCL No. 9 in the same section to 7800 ft. and completed for 850 barrels from 7580 ft. in the Stevens zone, only to have the well die and stay dead within 48 hours. KCL No. 10 drilled to 8500 ft. and found all formations barren. The company further tested the area by participating in a try with the Union Oil Co. in KCL No. 8 in sec, 11, 30-26 which, at the time, set a new California depth record of 12,618 ft.

Four miles southwest, in the Strand Area, Tidewater Associated Oil Co. is drilling Cont-KCL No. E-35-1 on sec. 7, 30-26. This try is on a Continental Oil Co. lease.

Gen. Pet. To Drill At Buena Vista Lake

Locating BVA No. 1, in sec. 1, 32-24, General Petroleum Corp. will test the area immediately northeast of the easterly arm of Buena Vista field. The site is but a short distance from the westerly shore line of Buena Vista lake bed. The surrounding lands have been heretofore prospected by numerous 3000 to 5000 ft. holes. The only well which approached a deep test was the BVA No. 1, drilled by Shell Oil Co. four miles southeast of the proposed Gen. Pet. try. This well, drilled within the original lake bed, was carried to 9453 ft. and abandoned in the Miocene formations.

Shell Oil Under Way On Cantua Creek Test

Rigging up of Port Costa No. 48-30 is evidence that the much discussed Cantua Creek project has been launched by the Shell Oil Co. The location, in the southwest quarter of sec. 30, 17-16, is 9 miles northeast of the north tip of the East Coalinga field and about 5 miles southeast of the Western Gulf Oil Company SPL No. 3 in sec. 3, 17-15. The latter well produced some 38 gravity oil from the Temblor zone before abandonment at 8531 ft. in May, 1937. Western Gulf has drilled two wildcats between the locations one of which was carried to 8868 ft. and discovered the Temblor to be barren. Shell and other operators have covered a large area with lease holdings.

Union Completes Cole's Levee Well

East of Ohio Oil Co.'s discovery well, Union Oil completed Kernco No. 1-11 in sec. 11, 31-25 for 600 barrels of clean 35.5 gravity oil from 9715 ft. West of discovery, Standard Oil Co. KCL No. 20-1 in sec. 9, 31-25, flowed an estimated twenty million feet of gas and small amounts of high gravity oil condensate on a formation test of the interval 8470-8556 ft. Bottom was last reported as 8585 ft. Ohio Oil Co. is preparing to deepen No. F-2, north of the first well in sec. 10, 31-25, after swabbing and getting a small flow by heads from 9653 ft. The yield was estimated at 245 barrels of 32 plus gravity oil and was

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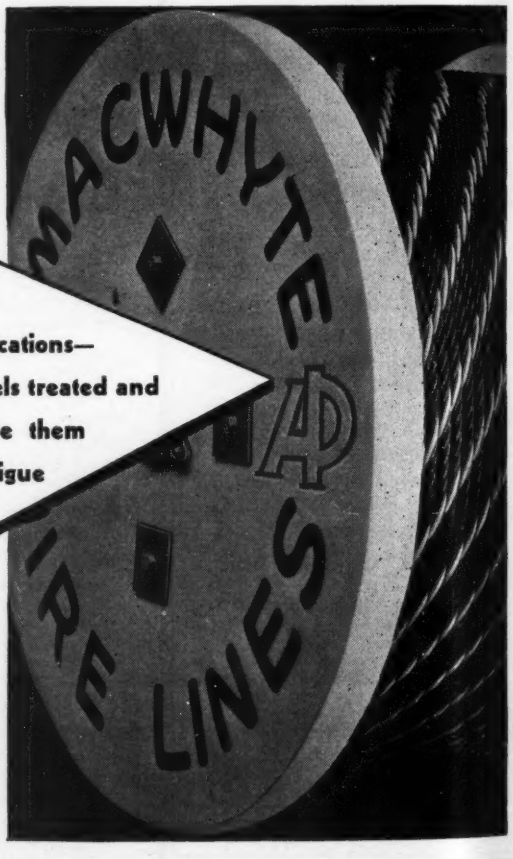

from the Second zone topped at 9330 ft.

A correlation of the four wells to find oil sand presents a very interesting picture. In sec. 10, Ohio's F-1 cored the first zone at 9220 ft., while 1350 ft. to the north, No. F-2 located the same point 60 ft. higher. Four thousand feet due east, Union's well encountered its first sand at 9640 ft., a drop of little more than 400 ft. if the sand tops are the same lithologic points. Production from the Union well was 600 bbls. of black oil with a comparatively low gas-oil ratio. One mile due west of Ohio's F-2, Standard Oil Co. cored a high volume gas sand at 8430 ft., nearly 800 ft. higher than the discovery well. Only conclusion possible with present facts is that the field will in all probability be quite extensive and trend generally to the west and north. The amount of apparent closure suggests a similarity to the Coalinga Eocene structure.

West Coalinga Outpost Drilling in Oil Sand

Finding oil sand believed to be the Eocene formation, Harry Rylatt is drilling ahead with Kipling No. 3. Located in sec. 26, 20-14, at the west edge of production, the project was last reported below 1250 ft. in shale streaked with oil sand.

A mile and a half to the north, Tyler & Cornwell No. 4 in sec. 14, 20-14 reports streaks of oil sand below 245 ft.

Roco Oil Co. Lindblom No. 1 was spudded as the most westerly of the Coalinga wildcats. Located in sec. 3, 20-14 the well lies more than 2 miles west of the edge production, and is below 300 ft. in blue shale.

Stuart Oil Co. in sec 12, 21-14 is drilling in blue shale below 1455 ft.

San Emigdio Area To Get Deep Tests

Acquisition of more than 2500 acres of Kern County Land Co. leases and the spudding of KCL No. 1A-8-32 in sec. 32, 11-22 by the Shell Oil Co., indicates a firm belief that the many shallow holes drilled in the area are not conclusive tests and that deeper drilling may produce profitable production. Six miles to the southeast, Continental Oil Co. also has many acres under lease and has located a project to be known as KCL No. F-1 in sec. 5, 10-21 which was last reported as preparing to build rig.

Edison Well Gets Small Production

Francis O'Reilly has completed Edison-Seale No. 5-26 in sec. 5, 30-29, north outpost of the Edison field. The well first flowed Mar. 11 and was making about 100 barrels through the casing. When the tubing was run the well would not flow and necessitated cleaning out. The production as of completion Mar. 23 was 100 barrels of 18 gravity oil cutting 5%. The flow is through 2½ inch tubing hung at 3760 ft. Production is from 3900-3922 and 4065-4155 ft.

Another Edison outpost, Oils Inc. of Calif. Cauley No. 1 in sec. 16, is making 8 barrels of 22 gravity oil cutting 5%.

Second Arvin Well Nears Possible Production

Coring streaks of oil sand to 6400 ft., Superior Oil Company P. D. Jewett No. 1 is preparing to set casing over the zone in which the Standard Oil Co. found 1500 barrel daily production at Arvin. The Standard well is one location to the north of the Superior project and is shut in pending completion of gathering lines. The third project in the discovery section 16, 31-29, is rigging up northwest of the producer, and is to be known as The Texas Co. Jewett No. 1. Near the west boundary of sec. 15 as near the known proved area as possible, Universal Consolidated Oil Co. is pouring foundation for Universal-Derby No. 1. The project is immediately south of Union's Berry No. 1 which was abandoned as non-commercial.

California Crude Oil Production

Two Weeks Ended March 25, 1939

	March Daily Quota	Average Daily Production	Excess
San Joaquin Valley			
Belridge—North	14,220	11,435	*2,785
Belridge—South	1,975	1,149	*826
Buena Vista	16,690	16,462	*228
Canal	4,485	4,525	40
Coalinga-East(Eocene)	3,482	3,173	*309
Coalinga—East-West	15,883	7,206	*8,677
Coffee Canyon	2,680	2,900	220
Edison	2,390	2,438	48
Elk Hills	7,565	9,940	2,375
Fruitvale	6,830	6,963	133
Greeley	2,100	1,615	*485
Kern Front	7,645	7,786	141
Kern River	5,740	2,548	*3,192
Kettleman No. Dome	55,495	56,988	1,493
Lost Hills	4,175	3,399	*776
McKittrick	3,840	3,698	*142
Midway	41,175	44,891	3,716
Mount Poso	13,120	13,199	79
Mountain View	8,300	9,235	935
Rio Bravo	6,905	8,104	1,199
Round Mountain	8,640	8,941	301
Ten Section	9,085	9,235	150
Wasco	610	1,232	622
Other Fields	2,480	2,458	*22
TOTAL	245,510	239,520	*5,990
Coastal Counties			
Elwood	4,400	4,662	262
Rincon	2,895	2,878	*17
Santa Maria	5,950	2,935	*3,015
Gato Ridge	2,060	3,187	1,127
Santa Maria Valley	18,800	10,746	*8,054
Santa Paula-Newhall	5,255	5,227	*28
Ventura Avenue	31,365	32,937	1,572
Other Fields	5,490	5,779	289
TOTAL	76,215	68,351	*7,864
Los Angeles Basin			
Alamitos-Seal Beach	7,150	7,793	643
Brea-Olinda	8,465	5,648	*2,817
Coyote—East	2,805	2,610	*195
Coyote—West	7,770	7,806	36
Domingues	18,500	21,521	3,021
El Segundo	3,455	3,654	199
Huntington Beach—New and Old	24,860	30,033	5,173
Inglewood	12,550	12,816	266
Long Beach	41,465	48,906	7,441
Montebello	5,994	6,342	348
Montebello-West End	5,376	8,957	3,581
Playa del Rey	4,900	5,345	445
Richfield	7,465	7,507	42
Rosecrans-Athens	9,970	15,383	5,413
Santa Fe Springs	26,855	28,970	2,115
Torrance	18,775	22,283	3,508
Wilmington	68,885	85,732	16,847
Other Fields	3,160	3,295	135
TOTAL	278,400	324,601	46,201
STATE TOTAL	600,125	632,472	32,347

*—Shortage.

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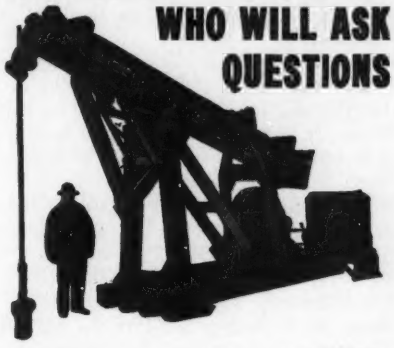

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Los Angeles Basin

Basin Wildcat Progress Reported

Several interesting exploratory wells are at present being drilled in the Los Angeles Basin. Most in the limelight has been The Texas Co.'s No. A-13, located in sec. 8,4-10 in the West Anaheim area. Last reported drilling below 8750 ft., the project has not encountered important showings since a formation test was made of poor oil sands at 7900 ft. Recovery was mostly water with a little heavy oil.

Back of the town of Seal Beach and east of the field of that name, Union Oil Co. has spudded in its Nietos No. 1. Location is north of a direct line between Seal Beach and Huntington Beach where many wildcats have been unsuccessful in the past.

Resuming its coreholing campaign in the Yorba Linda district, Shell Oil Co. has spudded its Stern No. 1A. The well seeks to locate the commercial production which has been indicated by several wells but never quite realized.

Two wells are working in the Whittier sector. C. W. Partridge is reported down 1700 ft. in Hillside No. 1 while H. C. Oil Co.'s Joyce No. 1 is below 3800 ft.

Temporarily shut down is John McKeon & Associates 8990 ft. project on Firestone Blvd. in the Carmenita area. Production tests have revealed the presence of small quantities of gas but no oil has been obtained.

West of the new Montebello development, Ridge Oil Co. is drilling its Sea Cliff No. 1 below 4600 ft. no showings having yet been reported.

On Cherry Ave. north of Signal Hill, Richfield Oil Corp. is drilling its Richville No. 1 in search of a new structure paralleling the old field.

No. 5 Is Big Well At Newhall-Potrero

Flowing initially 1200 bbls. of 35 gravity clean oil through a 24/64 in. bean, Barnsdall Oil Co. brought in its fifth well on the Rancho San Francisco lease in the Newhall-Potrero field. Bottomed at 7103 ft. and with the liner perforated at intervals below the shoe of the water string at 6360 ft., No. 5 is the fourth big well for the company in the field it discovered less than two years ago. Because of mechanical difficulties and shallow zone penetration, the discovery well is a small producer, making only 150 bbls. a day.

Indicative of the excellence of the field are the flow pressures and the fine gas-oil ratios of the wells. Now beaned back to 247 bbls. with a 9/64 in. orifice, gas production for No. 5 is 200,000 cu. ft. and the tubing pressure is 1200 lbs.

Equipment has been moved to No. 6 which is preparing to spud in.

This remarkable one company field is located west of the town of Newhall in sec. 26, 4n-17w.

Completions Up In Harbor Field

Reminiscent of its earlier days, Wilmington saw the completion of more than a dozen wells during the past fortnight, the majority in the Long Beach Harbor section. Large production was obtained by Signal Oil Co. in the first three wells of its sub-channel drilling campaign, the surface locations for two of which are on Union Pacific property. Now beaned back to conform with the curtailment program, all three were reported as initialling over 300 bbls. All are Terminal zone producers.

Two Terminal wells were finished by General Petroleum Corp., Harbor Comm. No. 35 being the largest. Located at the intersection of Ventura Ave. and Seaside Blvd., the well flowed 1050 bbls. in 14 hours through a 32/64 in. bean from the Upper Terminal zone with a flow pressure of 1150 lbs. Last reported production was 317 bbls. of 27 gravity oil through a 14/64 in. bean under 500 lbs. flow pressure from the Lower Terminal zone, the Upper Terminal being shut in.

In the center of 7th St. and near its west end, General Petroleum Corp. finished P. E. No. 2 at a depth of 4120 ft. The 1000 bbl. initial has been cut back to 300 bbls. of 25 gravity oil cutting 5.0%.

Two more wells were completed by Universal Consolidated Oil Co. on its west 7th St. Newport lease, both being small Ranger zone wells.

Directionally drilled sub-channel wells were finished by D. D. Dunlap Oil Co. and Westgate-Greenland Oil Co., both being located near the harbor entrance. Though held to small initials, the wells are capable of large production.

Union Pacific Railroad Co., the fields largest operator, added two more to its string of producers. No. 101, located in the first line south of Anaheim Blvd. and near the Edison right of way, was an upper zone gravel pack job. Bottomed at 3290 ft. and with 7 in. casing cemented at 3018 ft., the lower portion of the hole was enlarged and a 4¾ in. liner landed

LOS ANGELES BASIN WILDCATS

Area	Well	No.	Section	Depth	Status
Bellflower	Clayton, Geo. L., Scott	1	32, 3-12	6897	Idle
Castaic	Royal Land Corp.	1	8, 4-17	1338	Idle
La Mirada	John McKeon and Assoc. Carmenita	1	21, 3-11	8990	Idle
Long Beach	Richfield Oil Corp., Richville	1	13, 4-12	2125	Drilling
Mojave	Mojave Pet. Co., Gorman	1	5, 8-18	510	Idle
	Jennings	2	33, 5-14	520	Idle
Montebello-West	Ridge Oil Co., Sea Cliff	1	3, 2-12	4461	Drilling
Newhall	Mangrum and Page, Lintz	1	4, 3-15	375	Drilling
	Newhall Drlg. Asso., Needham	4	13, 3-16	3505	Idle
	Palmluck Oil Co.	1	23, 3-16		Rig
Palmdale	Neu-Cal	1	17, 6-12	1250	Idle
Palos Verdes	Rolling Hills Pet.	1	27, 4-14	5385	Idle
Playa del Rey	Samarkand Oil Co., Samarkand	1	34, 2-15	425	Drilling
San Pedro	Grady, R. T.	1	23, 5-14	650	Idle
Torrance	Blackstone Oil Co.	1	2, 4-14		Grade
Whittier	Langstaff, Geo. W., Iliff	1	8, 2-11	2250	Idle
	H. C. Oil Co., Joyce	1	22, 2-11	3820	Drilling
	C. W. Partridge, Hillside	1	22, 2-11	1725	Drilling
	Orange County				
Anaheim	The Texas Co.	A-13-1	8, 4-10	8716	Drilling
Bolsa Chica	Patos Drilling Co., Graham	1	21, 5-11	5900	Drilling
Costa Mesa	A. V. Oil & Gas Co.	1	16, 6-10	4751	Idle
Kraemer	Congress Oil Co.	2	36, 3-9		Foundation
Seal Beach	Union Oil Co., Nietos	1	12, 5-12	1020	Drilling
Yorba Linda	Shell Oil Co., Stern	1-A	23, 3-9	638	Drilling
	San Bernardino				
Carbon Canyon	Carbon Canyon Oil Co.	1	30, 2-8		Rig
Chino	So. Counties Pet. & Drlg. Co.	1	22, 2-8	2830	Idle
	San Diego County				
Carlsbad	Dauphin Dev. Co., Kelly	1	16, 12-4	1201	Idle
	Imperial County				
Salton Sea	Cawthon, Max	Section 2	2, 11-13		Location
	(Carbon dioxide well)				

and gravel packed. Completed as a flowing well, production is 125 bbls. a day.

No. 107 was completed by the railroad company as a Terminal zone producer with perforations open at intervals from 2916 ft. to bottom at 3998 ft. Initial production was held to 585 bbls. a day.

In the central harbor section, Independent Drilling Co. redrilled its Vosper No. 1 to 3568 ft. and completed with a flow of 450 bbls. through a 16/64 in. orifice. Only 90 ft. of zone is in use.

Richfield Oil Corp. obtained another Ranger well, No. 25, on the Pacific Dock & Terminal lease. Bottomed at 3090 ft. and with 290 ft. open, the well flowed 160 bbls. a day.

In the northwesterly Wilmington townlot section, two wells were returned to production after redrilling operations. Burns Oil Co. No. 1, at the southeast corner of Denni and Marine Sts., finished at 3665 ft. with initial production estimated at 300 bbls. a day. Several blocks to the east, V. R. G. Wilbur got a small well in the recompletion of Santa Fe No. 3 at 3725 ft. Both wells utilized the new shop type gravel packed 5½ in. liner which is proving so successful in this field.

Deepening a former Sun Ray Oil Co. well at the corner of Anaheim and Pioneer Sts., Vulcan Oil Co. obtained a small Ford zone well at 5371 ft. Production on the pump is said to be 125 bbls. a day cutting 12.0%.

Rushing work on its large scale drilling program, Long Beach Oil Development Co. is preparing to drill 12 wells at once on the municipally owned tidelands. Actual drilling will be done by sub-contractors.

Hollywood Oil Co. is planning two more wells for its Baxter lease, the rig already being erected for No. 6, while No. 7 is a location.

South of Anaheim near the city gas holder, Allied Petroleum Corp. is completing No. 1 in the Ranger zone and is planning to drill No. 32 immediately in the same area.

In the northwest section of Wilmington, Padreson Oil Co. is preparing to complete its D-55-2.

Torrance Activity Shows First Decline

First sign of the inevitable drop in Torrance drilling activity was seen in the last week when only one new location was reported in contrast to the late average of half a dozen. Chief reason for the abrupt slowing was the poor performance of wells in the 240th St. and Eshelman area. Although these wells may yet obtain reasonably good yields, it is the belief of most engineers that the limit of commercial production in that section has been reached, barring of course, an unforseen discovery. Perhaps equally potent is the growing realization that the average well decline rate of one percent per day will probably not allow an ultimate recovery of much over 20,000 bbls. per acre throughout the entire extent of the Del Amo zone.

Hope for continued drilling activity seems to lie in the prospects of obtaining good production east of Walnut Ave., there being but few remaining well located sites in the "Hot Spot" east of Eshelman. Some encouragement was lent by an open hole production test in Ray Wilson's No. 3, located approximately 1000 ft. southeasterly from the intersection of 240th St. and Walnut Ave. For a short period the flow was estimated at 65 bbls. an hour of 29 gravity oil. Some evidence indicates a fault exists between this well and those to the west.

Vital to the further extension of the field are the two southeasterly outposts, Riviera Petroleum Co. No. 1 and King Petroleum Co. No. 1. At 5000 ft., both wells had encountered stringers of oil sand but neither had yet nested for production.

Largest of the recent completions was Lebow-McNee Oil's Kettler No. B-1 located north of the Wilson No. 3 and near the east end of 240th St. With 365 ft. of

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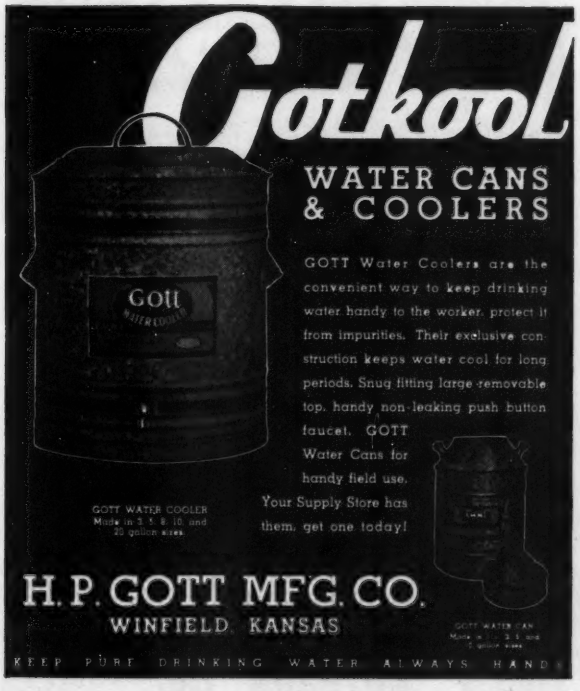
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zone open to bottom at 5156 ft., the well came in at the rate of 1041 bbls. a day with a cut of 5.0%. West of Walnut Ave. and 475 ft. south of 240th St., Golden Bear Oil Co.'s Goemoery No. 1 was finished at 5170 ft. flowing 275 bbls. cutting 10.0% but has failed to satisfactorily maintain it's rate.

Samarkand Spuds Del Rey Outpost

Samarkand Oil Co., a new concern headed by G. de Bretteville, has spudded its Playa del Rey southwest edge test. The well adjoins the Treasure Oil Co. project which was completed a few months ago substantiating Mr. de Bretteville's claim that production could be obtained in this area.

Five Points Area Now Dormant

Failure of Dragon Oil Co. to develop production in its Jauman No. 1 north of the closely grouped producers in the Huntington Beach Five Points area has resulted in the indefinite suspension of nearly all plans for new work. Only exceptions are the possible taking over of the Dragon well by a new operator and the rumored drilling of a well on the Booth Oil Co. lease offsetting J. E. F. Oil Co's producing wells.

In the ocean front section of the Huntington Beach field, Southwest Exploration Co. completed State No. 10 pumping nearly 400 bbls. and is drilling Nos. 11 and 15. The Texas Co.'s old field well, Brown No. 10 is still trying to overcome water trouble which has, so far, hindered completion.

D. & B. Oil Completing Fourth Extension Well

D & B Oil Co. is completing its fourth well in the Torrance Extension area it discovered last summer. With bottom at 5187 ft., casing was cemented at 5065 ft. The project is located south and east of the intersection of Vermont Ave. and Lomita Blvd.

General Petroleum Corp. has finished its Poggi No. 14 and is redrilling No. 7 on the same property. The Texas Co. is below 4800 ft. with its Oakley No. 5.

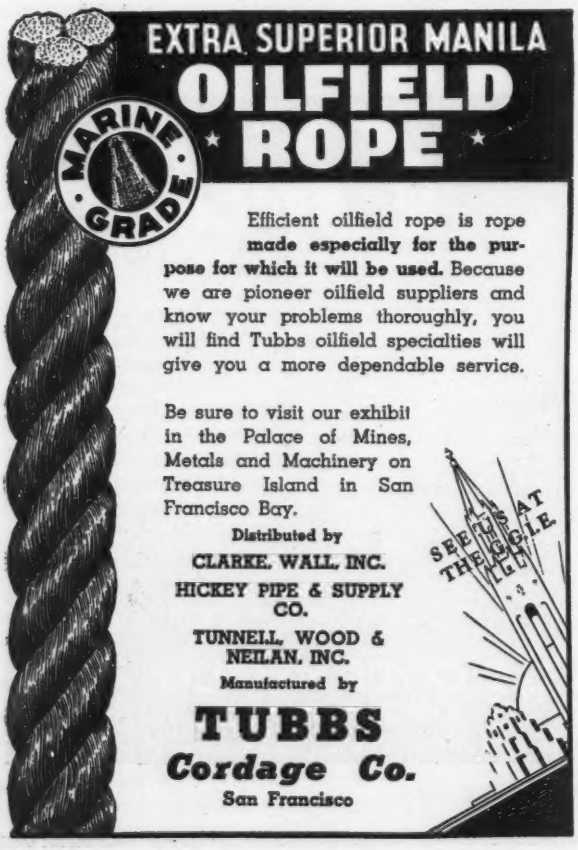
Montebello Field Tests Engineers' Skill

Proving to be a field where generalities are shattered by many exceptions, West Montebello provides a stiff test of the science of petroleum engineering. After more than a year of intensive development, many important questions remain unanswered and each well is drilled as though it were a wildcat, testing each zone penetrated before deepening to the next.

Outpost wells at opposite ends of the area share the spotlight at the present time. Union Oil Co.'s La Merced No. 30, most easterly project, failed to uncover new oil sands below the middle 7th zone and plugged back from 8468 ft. A string of 7 in. casing was cemented at 7550 ft. and the well is being readied for a production test. When first cored, a formation test of the interval 7550-7640 ft. resulted in a flow estimated at 600 bbls. La Merced No. 30 was a keen disappointment to many who confidently expected it to encounter deeper oil sands.

At the southeast corner of Lincoln Ave. and 6th St., Graham & Loftus have made two significant formation tests in Coffman No. 1. With a 75 ft. interval open to 6710 ft., a 1550 ft. fluid recovery was obtained which included 900 ft. of oil and 650 ft. of salt water. After this doubtful test of the lower 6th zone, the project was deepened to 7010 ft. where a test of the upper stringers of the 7th zone proved wet. A further penetration of the horizon is expected to uncover commercial sands.

Apparently destined to become a good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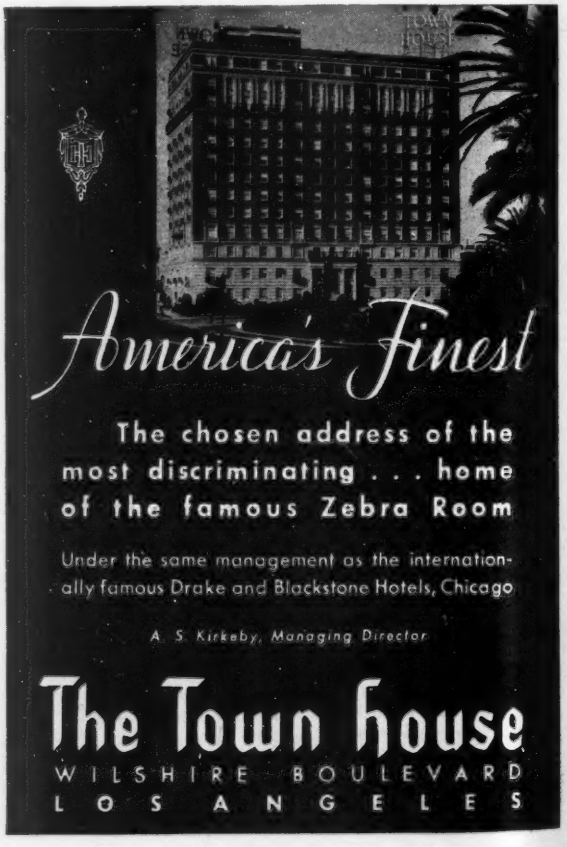
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easterly producer is St. Helens' Mulholland No. 4 at the northeast corner of Montebello Blvd. and Lincoln Ave. Formation tests have shown both the lower 6th and the 7th zones to be prolific and clean, a flow of 80 bbls. an hour being reported from the interval 6640-6713 (lower 6th—Masser zone). A blank liner was cemented on bottom at 7175 ft. and gun perforated.

Most northwesterly well is St. Helens' Monterey No. 30, located north of the reservoir. Bottomed at 7275 ft., a liner has been cemented and the well is being completed after being perforated in both the lower 6th and 7th zones.

With the single exception of Montebello Reservoir Oil Co.'s No. 2, no new wells have recently been started, operators being content to await results of wells now drilling. Important easterly projects, beside Union's La Merced No. 30 and Graham & Loftus' Coffman No. 1 are Wood-Callahan's Harris No. 1, Vulcan Oil's Nash No. 1 and The Texas Co.'s Mulholland No. 5. The former two are drilling below 6500 ft. while the latter is preparing to complete with bottom at 7202 ft. Development in the westerly portion of the field depends to a great extent on the findings of the Bush well on the Olds lease, which if successful, will extend known limits by about 400 ft.

A northerly offset to Hathaway Oil Co.'s 7th zone discovery well was completed by Standard Oil Co. when Braun No. 5 was placed on production flowing 1000 bbls. of 38 gravity clean oil. Open interval is 140 ft. to bottom at 7160 ft.

T. W. Associated Completes Second Aliso Canyon Well

Bottomed at 5200 ft. and with 570 ft. of shale and oil sand open below the shoe of the water string, Tide Water Associated Oil Co. is completing Porter No. 2, its second well in the Aliso Canyon field. The project is located west of the discovery well completed last fall with an initial production of 1000 bbls. a day. Locations have been selected by the company for six more wells in the field.

Showing heavy oil in the fractured shale formation, Standard Oil Co.'s northerly offset is drilling below 4750 ft. Union Oil Co.'s Santa Susana Orcutt No. 1, located northeast of the Porter wells, was last reported at 4250 ft.

Bolsa Chica Wildcat Cores Streaks of Oil Sand

Definitely encouraging is the word from Patos Drilling Co.'s Graham No. 1, wildcat test of the Bolsa Chica Mesa between Seal Beach and Huntington Beach. From 5916 ft. to last reported bottom of 6043 ft., oil sand stringers totaling 25 ft. had been recovered in the cores, the streaks showing good cuts and strong odors. Still in the Repetto, the operators believe that a commercial sand body should be uncovered at the Pliocene — Miocene contact which is expected within the next few hundred feet.

Metcalfe Finishes S. E. Rosecrans Well

Flowing initially at the estimated rate of 650 bbls. a day, Metcalfe Oil Co. completed its first well in the Rosecrans field. Bottomed at 7702 ft. and with 150 ft. of formation open in the O'Dea zone, the well extends proved limits one location to the south on Maple Ave. in the southeasterly section of the field.

South of Rosecrans Ave. and west of Figueroa St., John H. Marion is preparing to drill a second well on the Rosecrans lease. No. 2 is located about 250 ft. south of No. 1, the pioneer project of the southwest area.

Union Oil Co. is completing Rosecrans No. 31, the company's only active well in the field.

Standard-Texas Co. In New Drilling Program

Two exploratory wells will be begun in Central Sumatra in April by the Netherlands Pacific Petroleum Co. This company is jointly held by the Standard Oil Co. of California and The Texas Co. The company has an exploration contract covering 600,000 hectares (1,482,000 acres) in this country.

The territory being explored borders on the eastern coast of Sumatra and is less than 150 miles north of the equator. Transportation at the outset was a great problem, owing to the contract area being almost entirely covered by virgin jungle with no roads at all. At the beginning all supplies had to be packed on the backs of coolies, frequently over old elephant trails. During 1938 a road was completed into the center of the area, so that it is now possible to go by motor car where before it was only possible to go by foot. The larger streams are also used to a considerable extent in moving heavier supplies and equipment.

The most advanced methods and appliances have been employed in this exploratory work, with, for example, the use of surface geological, reflection seismograph, and photo-geological instruments.

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Coastal District

Wildcats Active In Sta. Barbara Co.

Most active of the coastal counties is Santa Barbara where many projects are under way by both major companies and independent operators. In the Los Olivos area, General Petroleum Corp. is below 3860 ft. in Chamberlain No. 1, located in sec. 12,7-31. Core data has been withheld by the company but no showings have been reported.

Still drilling in Foxen Canyon, Richfield Oil Corp.'s Tinaquaic No. 1 is in hard shale near the 5000 ft. level. Oil has been noted at times in the shale fractures.

Arnold Oil Corp.'s Apache No. 2 which was finished as a small pumper over a year ago is preparing to deepen below present bottom of 6375 ft. The well is located in the Carreaga area and adjoins Douglas-Stratton Oil Co.'s small producer.

Richfield Oil Corp.'s recently announced San Marcos No. 1 has not yet progressed beyond the location stage. Site of the proposed well is in sec. 20,6-29.

In the coastal area of the county, exploration is largely in the hands of independent operators. In the outskirts of Summerland, Oil Group, Inc. is drilling at 1500 ft., the formations encountered being unreported.

Western Oil Royalties, Inc. abandoned its exploration in the westerly section of the town of Carpinteria after failing to encounter commercial oil or gas to 2100 ft. Reports from Santa Barbara indicates the company to be planning another well.

Continued but slow progress describes the status of Litho Oil Co.'s No. 1 on the Rhode Island Estate just east of the Capitan field. After many months of drilling, a depth of 1650 ft. has been attained.

Hopper Canyon Interest Again Is Increasing

After its usual winter hibernation, Hopper Canyon is again catching the interest of the oil fraternity. J. A. English has abandoned the old Commander Oil Co. well No. 7-F and is preparing a new well to be called Lankershim No. 2. In the same section, 13,4-19, Nevada-Fortuna Oil Co. is planning to drill Hadley No. 1.

David M'divani has given up his plans of deepening the Phillip Brain well, in sec. 14, now idle at 1100 ft. Another independent operator is rumored to be considering taking over the project.

Merchants Petroleum Co. encountered oil sand in Cochrane No. 8 at 1760 ft. and was last reported in the same formation at 1800 ft. The well is an outpost of the small spot of good production developed by the company in sec. 1,4-20.

C. C. M. O. Successful In Two Rincon Zones

Productive possibilities of two zones were demonstrated by recent tests in Chanslor-Canfield Midway Oil Co.'s. Hobson B-25 at Rincon. With bottom at 4568 ft. and 8⅝ in. pipe cemented at 4000 ft., casing was perforated from 3600 to 3690 ft. with 180 holes resulting in a flow of 486 bbls. The hole was then cleaned out to bottom, and with a liner in the lower zone, a yield of 379 bbls. was obtained. It is planned to complete the well flowing from both intervals. Production from the two horizons is expected to total nearly 1000 bbls. a day.

Permit No. 82, well No. 4, Steel Island

NORTHERN COUNTIES WILDCATS

County	Well	No.	Section	Depth	Status
Monterey	Anderson, A. A., Hillman	1	15, 24-14	4004	Idle
	The Texas Co., Arroyo Seco	1	11, 19-15	2425	Drilling
Santa Cruz	Faria, Joseph Jr.	1	12, 11-3		Location
	Hatcher, Homer	1	8, 9-1		Location
Stanislaus	Santa Maria Pet. Co.	1	34, 1-10	2310	Idle
Sutter	Buttes Oilfields, Inc.	5	1, 15-1		Rigging up

COASTAL COUNTIES WILDCATS

Area	Well	No.	Section	Depth	Status
Santa Barbara County					
Capitan	Litho Oil Co., Rhode I.	1	4, 4-30	1645	Drilling
Carreaga	Arnold Oil Corp.	A-A 2	8, 8-33	6373	Deepening
Carpinteria	Western Oil Royalties	1	32, 4-25	2023	Testing
Foxen Canyon	Richfield Oil Corp., Tinaquaic	1	36, 9-32	4931	Drilling
Gaviota	Gaviota Oil Co., Hollister	1	35, 5-33	3215	Idle
Gato Ridge	Barnsdall Oil Co., Mag.	5	9, 8-32	4385	Producing
	Pezzoni	1	15, 8-32	4494	Idle
	The Petrol Corp., Tognazzini	32-A	9, 8-32		Rig
Los Olivos	General Petroleum Corp., Chamberlin	1	12, 7-31	3827	Drilling
	United Western Oil Co.	1	15, 7-30	3540	Drilling
San Marcos	Richfield O. Corp.,San Marcos	1	20, 6-29		Location
Summerland	Garman Oil Co.	17-1	22, 4-6	1487	Idle
	Oil Group, Inc., Hyland	1	16, 4-26	1225	Drilling
San Luis Obispo County					
Edna	Loma Grande Oil Co., Lewis	1	28, 31-13	2125	Idle
Elk Horn	Calif. Pet. Prod., Irons	1	19, 10-24	1965	Drilling
	Newton, S. M., Stafford	1	18, 31-21	1178	Drilling
	Temblor Oil Co.	1	22, 31-21	3465	Idle
Huasna	Hancock O. Co.,Scherer-Dickes	1	30, 12-33	5593	Idle
Paso Robles	Vanguard Oil Co., Clark	1	26, 27-14	4951	Idle
	Epco, Inc.	1	27, 26-13	5010	Drilling
Ventura County					
Ojai	High Mesa Oil Co.	1	16, 4-22	1770	Testing
Red Mountain	Martin, J. W.	3	15, 4-21	1260	Idle
Sespe	Drain Oil Co., Cosby	1	14, 4-19	1120	Idle
	Claran Oil Co., Hardison	1	22, 4-20	2940	Idle
	Commander Oil Co.	7-F	13, 4-19	575	Abandoned (as J.A. English No. 1)
	English, J. A.	2	13, 4-19		Location
	Merchants Pet., Cochran	8	1, 4-20	1805	Drilling
	Nevada-Fortuna Oil Co.	1	13, 4-19		Location (grading roads)
	Renard Oil Co.	1	6, 4-19		Rigging rotary
Shiells Canyon	Galveston Oil Co.	1	5, 3-19		Foundation
	Shomy Oil Co., Shomy	1	32, 4-19	620	Drilling
South Mt.	Clipper Oil Co.	1	17, 3-20		Rig
Tar Creek	Section 20 Oil Co.	1	20, 5-19	2550	Drilling
Timber Canyon	Stallings, Senter, Ahlberg	1	24, 4-21	1445	Idle
Ventura	Ventura Drilling Co.	1	10, 3-23	2285	Idle
	Ventura Exploration Co., Sexton	1	30, 3-22	9511	Idle
Wheeler Canyon	P & M Oil Co.	1	24, 4-22		Grade

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PAUL GRANARD, Beverly Hills

"I have a Buick Coupe purchased in 1935. It has run 101,975 miles with Triton, and still has the original rings and does not yet burn any oil in the 1000 mile period."
H. J. BRIGGS, Seattle

"During the last 3 years I have owned a Packard, a Willys, and an Oldsmobile. In all three I used Triton exclusively. The Olds has gone 35,000 miles and thanks to Triton it hasn't developed a carbon 'ping' since the day I bought it."
A. NEIL HUTZMANN, Los Angeles

project of Rincon Development Co., located 1500 ft. off shore, cored 27 ft. of promising oil sand to bottom at 2077 ft. After an electric log was run under difficulties, preparations were being made to run casing.

New Wildcat For Shiells Canyon Area

West of the Shiells Canyon field, Galveston Oil Co. is preparing to drill a new wildcat in sec. 5,3-19. North of this project and near the Highway, Shomy Oil Co. is drilling its first well below 625 ft.

High Mesa Tests Liner Splice

In an attempt to shut off surface water before making a production test, High Mesa Oil Co. has cemented two strings of casing together in its Butcher No. 1 near Ojai. The 1765 ft. hole has been plugged to 820 ft. where it is planned to complete the well.

Ventura Edge Well Cores Oil Sand

Lloyd Corp.'s easterly edge well, No. 2, is reported as coring fair oil sand identified as the Lloyd 57 zone at 9625 ft. It is planned to open more hole before making any production tests.

A remarkably good job of drilling is being done in the Alliance Petroleum Co. well in the Ventura Ave. sector. To present depth of 7760 ft., no trouble of significance has been encountered and the hole is said to be beneath the derrick floor all the way down. The last few hundred feet has shown evidence of strong gas pressure.

British American Oil Producing Co.'s Hartman 7 continues to be the jinx of the field. With bottom at 7900 ft., the crews are endeavoring to recover two fish.

Completion Scheduled For Santa Maria Field

Scheduled for early completion is Gerard & Thompson's Berneiser No. 1 in the Santa Maria Valley field. Located in sec. 27,10-34, the well penetrated the entire thickness of Monterey encountering the top of the Franciscan schist at 4965 ft. and bottoming at 4970 ft. Water string has been cemented at 4521 ft. preparatory to final completion.

E. H. Moore, Inc. has completed both of his westerly wells but lost a pump in No. 11 necessitating a rather nasty fishing job. No. 12 is standing shut in after a successful production test.

Sage and Krick Speak At April Meeting of C.N.G.A.

At the April regular monthly meeting of the California Natural Gasoline Association were presented the following interesting papers which will be published in full in the Second Issue, April, of the California Oil World, official publication of the association.

"Compression of Hydrocarbon Gases", presented by Dr. B. H. Sage, assistant professor of chemical engineering, California Institute of Technology.

This paper, co-authored by Dr. W. N. Lacey, professor of chemical engineering, California Institute of Technology, and presented by Dr. Sage, analyzed the thermodynamics of gas compression in terms of a steady state slow process and indicated the applicability of thermodynamic data to the solution of such problems. The paper included essentially new data concerning the thermodynamic properties of methane-ethane mixtures. The methods developed have been applied to the predicted performance of an industrial compressor and makes a comparison with that actually obtained under several operating conditions. These methods may be of greater utility in connection with the prediction of compressor performance at relatively high pressures where the deviation of hydrocarbon gases from the "perfect gas laws" become of engineering significance. The paper forms a part of the activities of Research Project 37, A.P.I.

"Three Dimensional Weather Analysis", by Dr. Irving P. Krick, associate professor of meteorology, California Institute of Technology.

More and more, commerce and industry are becoming "weather conscious," recognizing the economic influence of weather upon markets and buying habits, supply and demand. Not only does weather exert a tremendous influence upon the demand for natural gas, but, likewise, upon the demand for and consumption of natural gasoline. Dr. Krick's paper dealt with the early history of meteorology, modern, scientific forecasting methods, manifestations of weather changes and the commercial application of meteorological data. As director of the Krick Weather Service, he has an international reputation, supplying many industries in the United States and Canada with a forecasting service accurately predicting weather conditions for a day, a week or a month in advance. Dr. Krick's paper, certainly one of the most novel and interesting ever presented before the group, was adequately illustrated by motion pictures.

Welding Research Program Promises to Advance the Art

New findings gathered from exhaustive load tests on alloy steels under a $100,000 welding research engineering program will be applied in ship construction, pipe lines, aircraft, tanks and other war machines. The investigations now being conducted at the University of Illinois will be helpful to welding engineers, it is believed, in all phases of transportation design and construction. Steel manufacturers will benefit, also, in that the new data now being gathered will aid them in proportioning the alloys in steels that they may be readily weldable.

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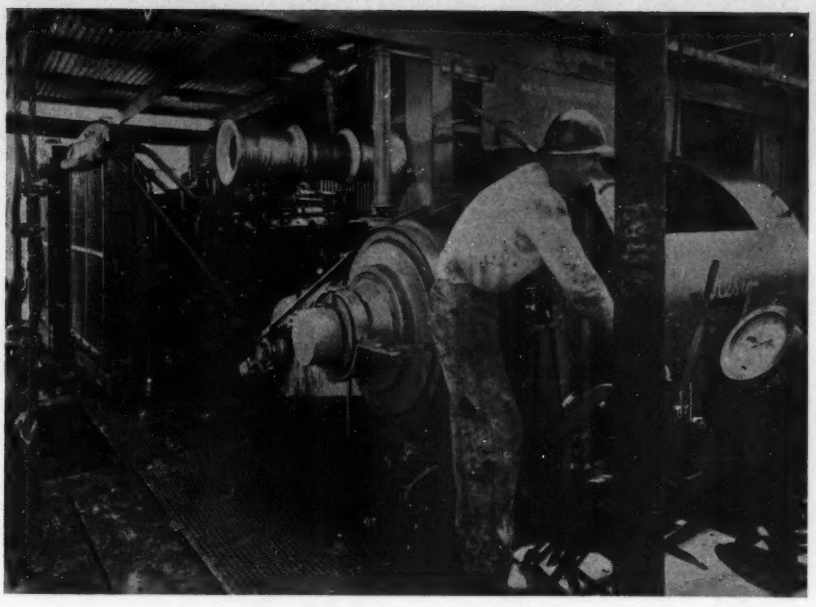
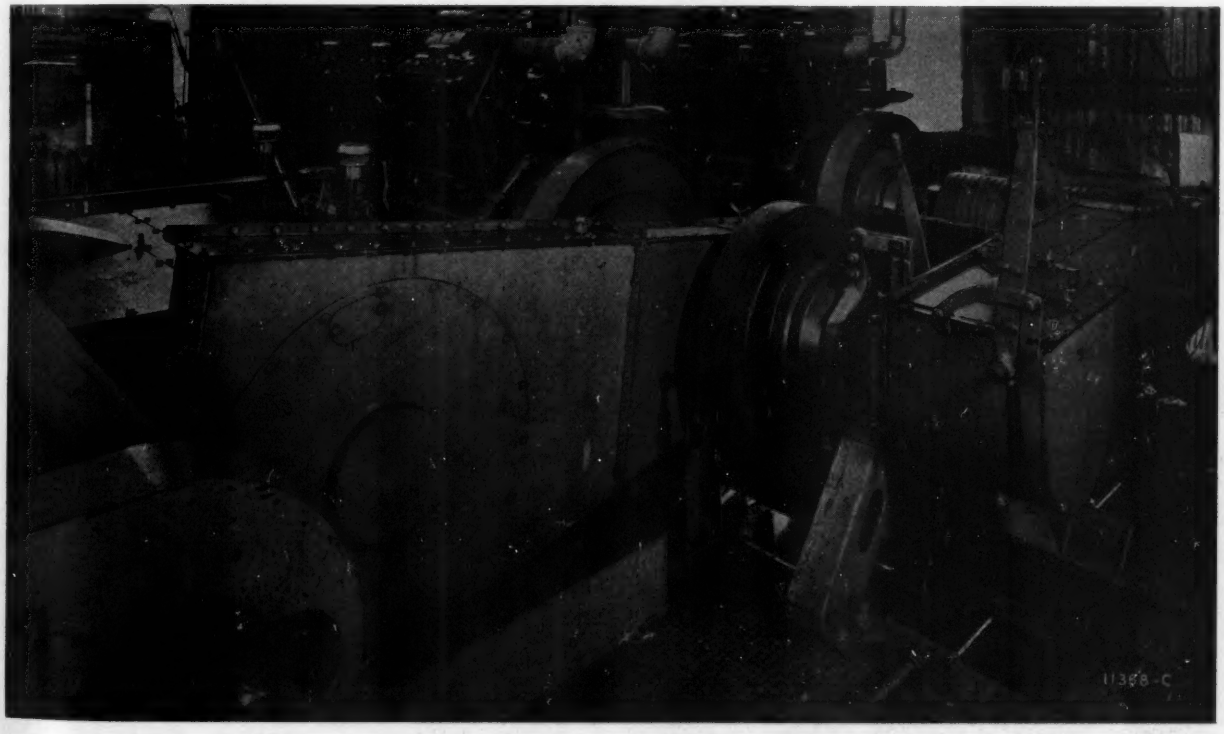


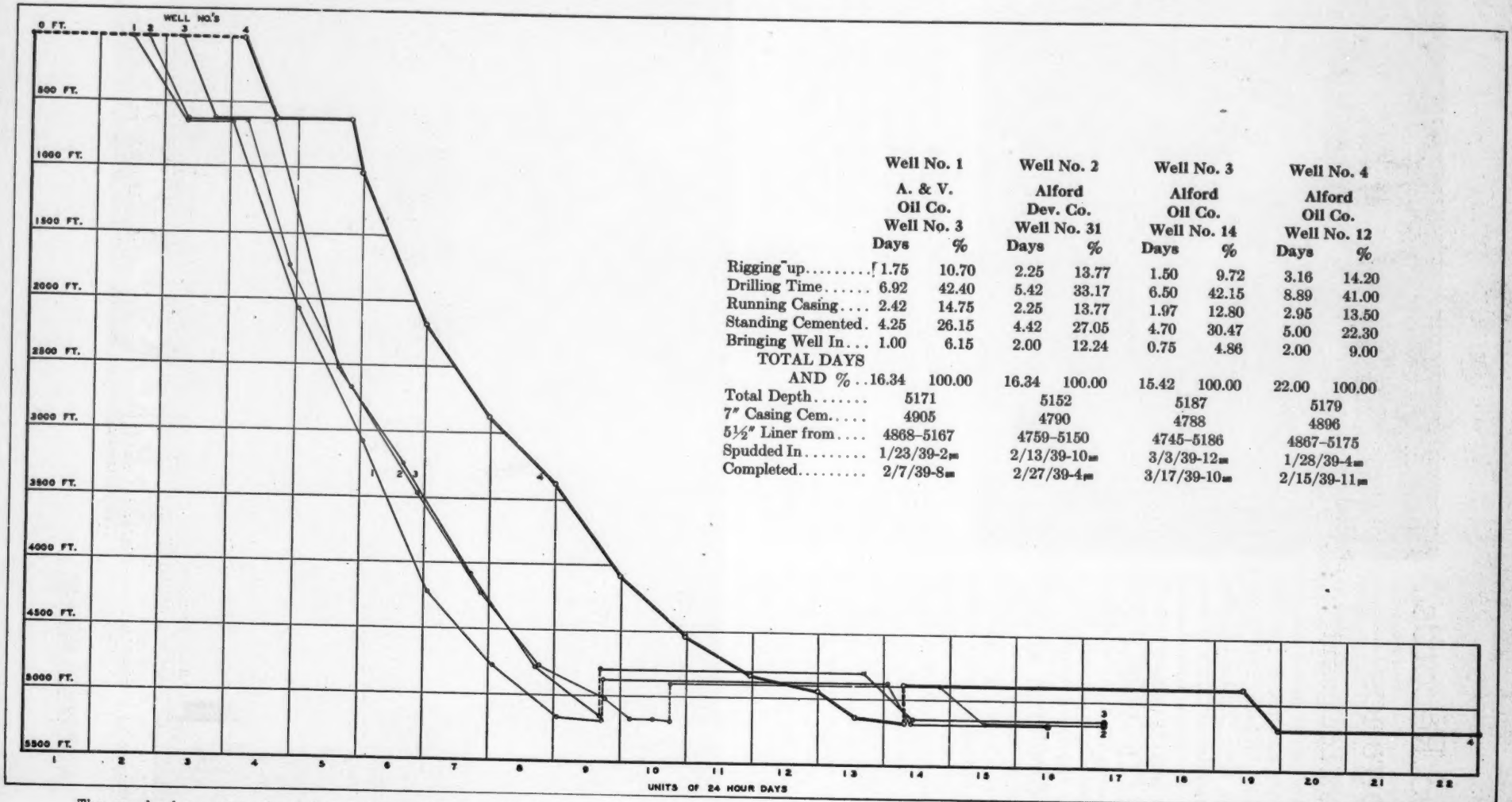
Rio Bravo doesn't hold a monopoly on speed and trouble free records for fields outside the "snowdrift" areas. Kern Drilling Co., who recently attracted attention by drilling town lot wells with bottom practically under the rotary table, is setting new time records in Torrance.

As in the San Joaquin newer fields, the increased rigging up, drilling and completion speeds are due largely to improved equipment. The size of the Torrance equipment is deceptive (See illustration). The draw works can easily handle 12,000 ft. of 4-inch drill pipe. The two Diesel engines are rated at 350 H. P. each and can go to 480 H. P. The transmission is rated at 1000 H. P. with a safety factor of 3½ to 1. On Page 28 the graph shows clearly the improvement in time for the various operations. Rigging up includes moving in and installing equipment. Drilling includes coring, running casing includes liner cementing, electric log, testing, changing drill pipe, cleaning out to bottom and wall scraping. Bringing well in includes running tubing, washing liner, installing Christmas tree, and swabbing. Data was provided by W. E. Dunlap, petroleum engineer for Alford Oil Co. Wells Nos. 1, 2 and 3 were equipped with Wilson equipment and Le Roi Diesel engines. Well No. 4 was equipped with conventional equipment.



Here is the powerful "chain-driven" transmission setup used in breaking speed records. At top of page is a view indicating the compactness of the equipment.

New Drilling Records Set at Torrance



	Well No. 1 A. & V. Oil Co. Well No. 3		Well No. 2 Alford Dev. Co. Well No. 31		Well No. 3 Alford Oil Co. Well No. 14		Well No. 4 Alford Oil Co. Well No. 12	
	Days	%	Days	%	Days	%	Days	%
Rigging up	1.75	10.70	2.25	13.77	1.50	9.72	3.16	14.20
Drilling Time	6.92	42.40	5.42	33.17	6.50	42.15	8.89	41.00
Running Casing	2.42	14.75	2.25	13.77	1.97	12.80	2.95	13.50
Standing Cemented	4.25	26.15	4.42	27.05	4.70	30.47	5.00	22.30
Bringing Well In	1.00	6.15	2.00	12.24	0.75	4.86	2.00	9.00
TOTAL DAYS AND %	16.34	100.00	16.34	100.00	15.42	100.00	22.00	100.00
Total Depth	5171		5152		5187		5179	
7" Casing Cem.	4905		4790		4788		4896	
5½" Liner from	4868–5167		4759–5150		4745–5186		4867–5175	
Spudded In	1/23/39-2p.m.		2/13/39-10a.m.		3/3/39-12a.m.		1/28/39-4a.m.	
Completed	2/7/39-8a.m.		2/27/39-4p.m.		3/17/39-10a.m.		2/15/39-11p.m.	

The graph above gives the drilling and completion records of four wells brought in by Kern Drilling Co. in Torrance field. The Light Lines are for wells in which a highly compact and powerful drawworks, rotary table and pump unitized system was powered by six-speed Diesels, and the heavy line is for a well in which conventional equipment was used in the same area.

LAUGH THIS OFF

We have just received from **Charlie Schneider** a report to the effect that a prominent oil man of Los Angeles is now undergoing a series of reducing exercises, and presume that the man is simply determined to become less prominent.

And we believe it was **Harrison Guio** who once greeted an acquaintance cheerfully in this wise: "Hi, Bill! How are you and/or the wife getting along these days?"

Which, of course, recalls the pumper who testified in one of these long drawn-out oil suits. Says the attorney for the prosecution, "Now I want you to answer this question very carefully." "Well," says the pumper calmly, "You be very careful what you ask."

Now arises **Frank Fontana** with an ingenious suggestion to eliminate oil field hazards. It is simply this: To avoid accidents, go for a ten minute walk five minutes before every accident.

There may be no truth in the story, but we are informed on fairly reliable authority that the following ad appeared in the "Personal" column of an oilfield daily a short time ago. "Gentleman with half bottle of vermouth would like to meet gentleman with half bottle of dry gin. Object—cocktails."

Returning again to the subject of accidents, **Max Anfenger** tells us about an ailing Long Beach operator who called the doctor in desperation, and urged, "Hurry over, Doc! My wife has one of those books on what to do before the doctor arrives, and I'm afraid she'll do it!"

And we know a medico who, even in his college days was known as Big Bill.

We also understand that **Wynn Lynch** was recently approached by a job seeker who had spent practically all of his life working in hotels, and Wynn decided he couldn't take the lad on because he was too inn experienced.

Then there was the Huntington Beach pipefitter who fell and broke an elbow.

And when they cut down the long grass on the Brentwood Golf Course recently, imagine their surprise to find **Roger Duke** still slashing desperately at an obstinate pellet.

Roger was the lad who walked boldly into a Signal Hill hash house and asked for fried oysters, and for the first time in his life was stumped for a reply when the chef said, "Sorry, we're all outa shell fish—'ceptin' eggs."

Speaking of fish, **Jerry Rusk** was out on the pier at Belmont Shore last week, and found himself right behind a juvenile angler. "How's it goin', sonny? Have you caught anything yet?" he asked, and you could have knocked him over with a Mack truck when the kid answered, "Naw, I had one on the hook a while ago, but he unbit and div."

Jerry suggests, by the way, that the old superstition about the ghost walking on payday probably develops from the fact that there is usually quite a rise of spirits at that time.

And one of the greatest exhibitions of patience we have ever known was made by the Brea pumper whose wife left him twenty-eight years ago. He is now suing for a separation.

In an oil company statistical office which shall be nameless, one of the clerks was laid off. He promptly walked out of the boss's office and said to the chief clerk: "Call up the Department of Labor, and tell them to increase their unemployment figures by one."

Now diverging into a statistical maze, we have just learned to our undisguised astonishment that the death rate among petroleum engineers is exactly one per person.

And its the funniest thing that the average oil man talks business at the golf links, and golf at the office.

Saying which we leave you to your own devices. Remember, a progressive town is one in which the streets are always torn to pieces immediately after the asphalt has been laid.

BAKER

The Big Idea in Successfully Cementing Casing is to use equipment which provides in perfect balance the three important features of . . . STRENGTH, VALVE EFFICIENCY and DRILLABILITY.

Capt. A. E. Higgins Heads Pittsburgh Equitable Sales

In a recent announcement, Col. W. F. Rockwell, president of the Pittsburgh Equitable Meter Co., stated that Capt.

Capt. A. E. Higgins

A. E. Higgins, a vice-president of the firm, has been placed in charge of sales for both the Pittsburgh Equitable Meter Co. and its subsidiary, the Merco Nordstrom Valve Co.

Before he became associated with the Pittsburgh Equitable Meter Co., Capt. Higgins was secretary of the Natural Gas Section of the American Gas Association. He has long been a prominent figure in the gas industry.

American Iron & Machine Selects Hopper Machine

An announcement of interest to the western oil men has just been made by John Riley, sales manager of Ameri-

John Riley

can Iron and Machine Works Co., of the appointment of Hopper Machine Works, Inc., of Bakersfield to handle the warehousing and servicing of the American Iron and Machine Works Co. products.

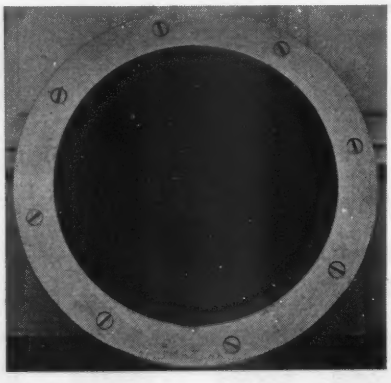
As in the past, the products of the company can be purchased through supply houses with a guarantee of service and parts through Hopper Machine Works.

Medearis Pipe Wiper Presents Novel Features

The Medearis Dri-Pipe Wiper is the result of more than a year and a half of experimentation and development of a device to practically and economically clean the drill pipe as it is being removed from the well, without the use of water. Its purpose is to conserve and keep the rotary mud from contamination, maintaining its weight and porosity, and eliminate the necessity of having to recondition the mud on each round trip. Since it is not necessary to use water to wash the drill pipe, considerable expense is saved in cases where it is necessary to haul the water from the well.

The Medearis Dri-Pipe Wiper is composed of two clamping rings machined of a non-conductive metal, thus eliminating any hazard that may be created due to friction or contact with the master bushing and yet keeping the disc rigid and preventing it from becoming damaged when not in use. This also permits refills for the various sizes of pipe and tubing, to be readily installed, and presents the most advantageous method of holding the rubber disc.

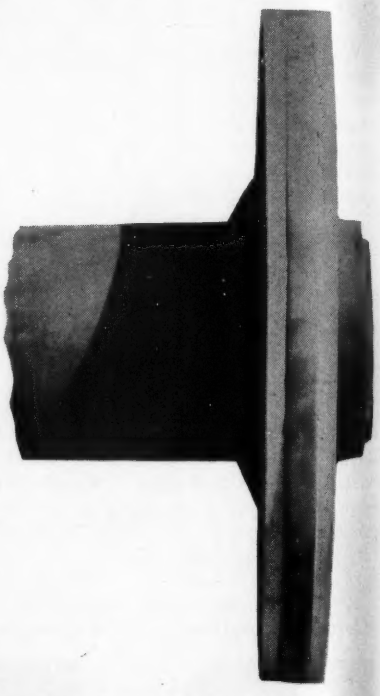
The rubber used in the construction of the disc is of a special formula and construction, permitting it to pass over tool joints, casing protectors and stabilizers, returning to its normal size without injury. Rings are molded on the



disc, properly spaced, so that they may be cut out for various sizes of pipe. The edges of these rings presenting an ideal wiping surface to the pipe, as well as adding strength to the point which is subjected to the greatest amount of wear. These rings also permit the same disc, when it becomes worn, to be used for the next size larger pipe by merely cutting the disc to the next indicated ring.

The Dri-Pipe Wiper is installed on the drill pipe directly below the master bushing, floating freely on the pipe. As the pipe is withdrawn, the pipe wiper is held in position by contact with the master bushing. When replacing the slips, the pipe is lowered sufficiently to permit the pipe wiper to make an ideal seal against the top of the pipe, thus eliminating the hazard of dropping any tools or broken pieces of equipment into the well.

With the use of the Medearis Dri-Pipe Wiper, greater safety is assured for the workman. The table and floor



are kept dry at all times and mud and water is not constantly dripping from the drill rope as it is being raised.

To readily identify it, the Medearis Dri-Pipe Wiper is made with red rubber. Medearis Dri-Pipe Wipers are carried in stock and are obtainable at the various warehouses of Medearis Oilwell Supply Co. throughout the state.

Medearis Dri-Pipe Wipers for use on tubing and sucker rods may be obtained, made of oil resistant rubber, on special order.

The corrosion bill for the oil industry of the world is over $300,000,000 a year.

Air Crash in India Kills M. O. Johnston Official

His many friends throughout the world will be shocked to learn of the

Buford W. Davidson

untimely death of Buford W. Davidson, export service manager for M. O. Johnston Oil Field Service Corp., who was the victim of an airplane crash near Karachi, India, on Feb. 23. Mr. Davidson had reached the halfway mark on an extended trip around the world in the interests of his company and was enroute from Bahrein to Lahore when the accident occurred.

Mr. Davidson was first employed by M. O. Johnston Oil Field Service Corp. in 1935. Three years later he made a trip to South America for the company, covering the oil fields of Trinidad, Venezuela, and Colombia, and had just recently completed a trip through Europe, Iraq, Iran and Arabia in his capacity as export service manager. Mr. Davidson, who was 34 years of age, is survived by his widow and two children.

Measuring Valve Parts

The latest issue of Valve Values, house organ of the Edward Valve & Mfg. Co., East Chicago, Ind., features a story on "Measuring Valve Parts". Equipment, methods, and problems are discussed and illustrated in detail. Also described in this issue are welded bonnet valves, valve requirements for new ships, details of modern non-return, feedline and blow-off valves, and the use of valves on high pressure railroad locomotives.

Cracked gas could produce all of the ethyl alcohol used in the U. S. yearly at a price lower than possible with the fermentation process.

An interesting hookup in Santa Fe Springs is this Lycoming powered Jensen jack distributed by Medearis Oilwell Supply Co.

Howard Supply Makes Two Personnel Changes

George Trembley, vice president of Howard Supply Co., 5125 Santa Fe Ave., Los Angeles, announces the transfer of W. R. (Bill) Brooke to the Los An-

W. R. Brooke

E. J. Craigo

geles Sales district from Huntington Beach, and the appointment of E. J. (Ed) Craigo as manager of production equipment sales.

Bill Brooke, who has been with Howard Supply since October, 1938, has operated in the San Joaquin Valley oil fields for the past ten years, and is well equipped to carry out his company's slogan of service. Ed Craigo, who can readily be spotted for the former star fullback that he is (Texas A & M), has a background of ten years in the California oil fields. The company has branches at Bakersfield, Long Beach, Torrance, Huntington Beach and Wilmington.

Ethylene and propene have been used to stimulate potato growth and transformation of starch into sugar.

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Oil Men's Calendar

C.N.G.A. Meeting First Thurs. Each Month.

April

13—Industrial Marketers of So. Calif.-Round Table Discussion of Advertiser's Problems. University Club—6:30 p. m. Dinner optional.

24-29—Oil World Exposition, Inc., Houston, Texas.

11—AMERICAN PETROLEUM INSTITUTE, DIVISION of Production, Pacific Coast District, Biltmore Hotel, Los Angeles, Calif.

24-29—Oil-World Exposition, Inc., Houston, Tex.

26-28—American Institute of Mining & Metallurgical Engineers, Open Hearth Conference, Cleveland, Ohio.

May

3-5—Natural Gasoline Assn. of America, Tulsa, Okla.

9-11—American Institute of Chemical Engineers, Akron, Ohio.

15-18—AMERICAN PETROLEUM INSTITUTE, 9th Mid-Year Meeting, Roosevelt Hotel, New Orleans, La.

21-25—National Assn. of Purchasing Agents, Annual Convention, (Oil Company Buyers' Group), Fairmont Hotel, San Francisco, Calif.

22-June 8—World Automotive Engineering Congress, sponsored by S.A.E. for New York (May 22-26), Indianapolis (May 30), Detroit (May 31-June 2), San Francisco (June 6-8).

Lerdo Tests Abandoned

Forsaking the quest for a continuation of the Mountain View-Fruitvale axis, the two projects making the try have been abandoned. The wells, drilled between previously abandoned ten thousand foot holes, have been carefully watched for possible production between Rio Bravo and the east side valley fields. The Texas Company was first to concede defeat on KCL No. 35-1, sec. 35, 28-26, which was abandoned at 8821 ft. after topping the barren Vedder at 8775 ft. South of this test, Shell Oil Co. KCL No. 2A-23-2 in sec. 2, 29-26, was abandoned in gray sand at 9557 ft. The Vedder, topped at 9557 ft. was found to be barren.

Richfield Western Area to Test

Richfield Oil Corp., discoverer of the Richfield-Western production, and the sole operators in the immediate area, is preparing to test Western No. A-52-32, just east of discovery well in sec. 32, 30-25. With bottom at 8793 ft. in coarse oil sand, the project has logged apparently rich zone from 8217 ft., 14 ft. higher than No. A-32-32.

A mile and one half northwest Standard Oil Co. is rigging up a wildcat in sec. 19, 30-25. The well to be known as KCL No. 21-1, is one mile due east of the Tupman townsite.